Table V — State of New York (exclusive of New York City):
for white childr

COLOR AND COUNTRY OF BIRTH OF MOTHERS AND ORDER OF 1920 BIRTH	Total	15 or less	16	17	18
Children of foreign-born white mothers — total	**31,154**	**12**	**51**	**164**	**342**
1st birth	4,803	12	46	148	268
2d birth	4,736	.....	5	15	60
3d birth	4,932	.....	.....	1	14
4th birth	4,327	.....	.....	.....	.....
5th birth	3,576	.....	.....	.....	.....
6t birth	2,674	.....	.....	.....	.....
7th birth	2,018	.....	.....	.....	.....
8th birth	1,438	.....	.....	.....	.....
9th birth	966	.....	.....	.....	.....
10th birth	683	.....	.....	.....	.....
11th birth	384	.....	.....	.....	.....
12th birth	242	.....	.....	.....	.....
13th birth	147	.....	.....	.....	.....
14th birth	63	.....	.....	.....	.....
15th birth or over	68	.....	.....	.....	.....
Order of birth not stated	97	.....	.....	.....	1
Children of mothers born in England, Scotland, Wales — total	**1,524**	.....	.....	**8**	**8**
1st birth	475	.....	.....	8	7
2d birth	361	.....	.....	.....	1
3d birth	243	.....	.....	.....	.....
4th birth	163	.....	.....	.....	.....
5th birth	88	.....	.....	.....	.....
6th birth	75	.....	.....	.....	.....
7th birth	35	.....	.....	.....	.....
8th birth	30	.....	.....	.....	.....
9th birth	21	.....	.....	.....	.....
10th birth	17	.....	.....	.....	.....
11th birth	6	.....	.....	.....	.....
12th birth	6	.....	.....	.....	.....
13th birth	4	.....	.....	.....	.....
14th birth	4	.....	.....	.....	.....
15th birth or over	1	.....	.....	.....	.....
Order of birth not stated	5	.....	.....	.....	.....

sive of New York City): *Births* (exclusive of stillbirths) *with the number of child in order of birth, b*
for white children by country of birth of mother: 1920 — (Continued)

AGE OF MOTHERS

15 or less	16	17	18	19	20	21	22	23	24	25	26	27	28
12	51	164	343	579	734	892	1,138	1,429	1,766	1,852	1,844	1,803	1,946
12	46	148	268	394	415	434	462	433	372	340	274	242	214
.....	5	15	60	136	191	238	344	419	507	448	378	305	308
.....	.....	1	14	45	85	168	219	359	474	490	436	411	400
.....	.....	.....	.....	3	35	40	80	155	273	353	399	401	379
.....	.....	.....	.....	1	7	9	21	46	101	162	229	270	337
.....	.....	.....	.....	.....	2	2	5	12	24	38	81	116	174
.....	.....	.....	.....	.....	.....	.....	.....	3	7	9	31	39	95
.....	.....	.....	.....	.....	.....	.....	2	.....	2	7	5	13	22
.....	.....	.....	.....	.....	.....	1	.....	.....	1	1	3	3	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	1	.....	2	.....	5	2	4	3	7	3	5
.....	.....	8	8	26	30	58	66	59	75	87	78	73	72
.....	.....	8	7	23	21	42	44	41	37	46	32	26	25
.....	.....	.....	1	2	7	15	18	13	27	24	24	19	19
.....	.....	.....	.....	1	1	1	4	4	9	11	16	16	12
.....	.....	.....	.....	.....	1	.....	.....	1	2	5	4	8	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	4	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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NEW YORK

LEGISLATIVE DOCUMENTS

ONE HUNDRED AND FORTY-FOURTH SESSION

1921

VOL. XXII — NO. 62

ALBANY
J. B. LYON COMPANY, PRINTERS
1921

Legislative Document (1921) No. 62

STATE OF NEW YORK

FORTY-FIRST ANNUAL REPORT

OF THE

STATE DEPARTMENT OF HEALTH

For the Year Ending December 31, 1920

VOLUME I

ALBANY
J. B. LYON COMPANY, PRINTERS
1922

STATE OF NEW YORK,

EXECUTIVE CHAMBER,

ALBANY, *April* 12, 1921.

To the Legislature:

I have the honor to present herewith the forty-first annual report of the State Commissioner of Health for the year 1920.

NATHAN L. MILLER.

New York State Department of Health

Commissioner, Hermann M. Biggs, M.D., LL.D
Deputy Commissioner, Matthias Nicoll, Jr., M.D.
Secretary, John A. Smith, M.D.
Executive Clerk, Fenimore D. Beagle.

Directors of Divisions

Division of Sanitary Engineering.................. Theodore Horton, C.E.
Division of Laboratories and Research...... Augustus B. Wadsworth, M.D.
Division of Vital Statistics.................... Otto R. Eichel, M.D., F.S.S.
Division of Communicable Diseases.......... Edward S. Godfrey, Jr., M.D.
Division of Child Hygiene........................... M. Edgar Rose, M.D.
Division of Public Health Nursing............ Mathilde S. Kuhlman, R.N.
Division of Public Health Education........ (Acting) B. R. Rickards, S.B.
Division of Tuberculosis.......................... Malcolm F. Lent, M.D.
Division of Venereal Diseases....................... J. S. Lawrence, M.D.

Public Health Council

Hermann M. Biggs, M.D., LL.D., New York City, *Chairman*
Joseph A. Warren, A.M., LL.B., New York City, *Secretary*

Mrs. Elmer Blair.. Albany
Chairman, Public Health Dept., General Federation of Women's Clubs
Simon Flexner, M.D., LL.D.............................. New York City
Director, Laboratories of Rockefeller Institute for Medical Research
Homer Folks, LL.D.. Yonkers
Secretary, State Charities Aid Association
Henry N. Ogden, C.E.. Ithaca
Professor, Sanitary Engineering, Cornell University
T. Mitchell Prudden, M.D., LL.D........................ New York City
Vice-President, Board of Scientific Directors, Rockefeller Institute for Medical Research
Jacob Goldberg, M.D... Buffalo
Ophthalmologist, Memorial Hospital

Consulting Staff

Bacteriologist.................................. William H. Park, M.D.
Director, Laboratories, New York City Dept. of Health
Animal Pathology.............................. Theobald Smith, M.D.
Director, Division of Animal Pathology, Rockefeller Institute for Medical Research
Communicable Disease............................ Alvah H. Doty, M.D.
Former Health Officer of the Port of New York
Surgeon... George D. Stewart, M.D.
Professor, Surgery, New York University and Bellevue Hospital Medical College
Dermatologist................................ Frederic C. Curtis, M.D.
Former Professor, Dermatology, Albany Medical College
Pediatrician............................. L. Emmett Holt, M.D., LL.D.
Professor, Diseases of Children, Columbia University, New York City
Child Hygiene.................................. Henry L. K. Shaw, M.D.
Former Director, Division of Child Hygiene, State Department of Health
Statistician............................. Walter F. Willcox, Ph.D.
Professor, Political Economy and Statistics, Cornell University
Public Health Education................ C.-E. A. Winslow, S.B., Dr. P. H.
Professor, Public Health, Yale University
Orthopedic Surgeon............................ Robert W. Lovett, M.D.
Professor, Orthopedic Surgery, Harvard University
Orthopedic surgeon............................. Royal Whitman, M.D.
Attending Surgeon, Hospital for Ruptured and Crippled, New York City
Syphilographer................................ John A. Fordyce, M.D.
Professor, Dermatology and Syphilis, N. Y. College of Physicians and Surgeons

FORTY-FIRST ANNUAL REPORT OF THE STATE DEPARTMENT OF HEALTH

REPORT OF THE COMMISSIONER OF HEALTH

PART I

Letter of Transmittal

To His Excellency, Nathan L. Miller, *Governor of the State of New York, Albany, N. Y.:*

Sir.— I have the honor to transmit herewith the forty-first annual report of the State Department of Health.

The lowest death rate in the history of the State Health Department was recorded for the year 1920, the rate — 13.0 per 1,000 — being 12 per cent below the average for the four years 1913–1917 in spite of the prevalence of influenza during the early part of 1920. Registration of vital statistics reached the highest point of efficiency yet attained, for considerably less than one per cent of all certificates and reports filed showed any delinquencies on the part of registrars, physicians, midwives or undertakers. A comprehensive monthly Vital Statistics Review, probably the most comprehensive publication of its kind issued by any health department was published during the year. Special studies of the statistics of influenza, marriage, infant mortality and standardized death rates were also made, preliminary reports of which will be ready for publication in 1921.

It is an historical fact that wars have invariably been followed by epidemics of syphilis and gonorrhea, and there was every indication that the Great War would prove no exception in this respect, but with the extra efforts that have been put forth by the government agencies and the Division of Venereal Diseases during the last three years it seems certain that New York State has not and will not experience this increase, or at most in only a limited degree.

Facilities for diagnosing and treating these diseases, which heretofore were confined almost entirely to the largest cities, have been provided throughout the State by means of forty-three clinics which are now functioning in thirty-eight up-state cities. During the last two years these clinics have given more than 110,000 treatments besides stimulating the local physicians to undertake this work. More than 30,000 doses of arsphenamine have been distributed to the clinics and to state institutions for the treatment of indigents or wards of the State.

In addition to the cooperation extended to the authorities of the state prisons, reformatories and hospitals in this work, the children in thirty-two orphanages have been examined by department officials and provisions made for the treatment of all those found to be infected. While syphilis and gonorrhea have always been widespread, it is only recently that the public has begun to appreciate fully how disastrous these diseases are to the economic life of the State. The force of this statement will be realized in a measure by comparing the 12,028 new cases of syphilis reported in twelve months with the 2,632 cases of typhoid fever reported during the same period.

Disturbed labor conditions will tend during the next year to augment the number of indigents suffering from venereal disease, and provision should be made by the State to meet the demand for free treatment which will result.

The situation with regard to adequate medical service in rural communities is steadily growing more serious. The first intimation of the existing

conditions came to the Department through the discovery that a very large number of local health officers were the only physicians in their respective municipalities and that the rural health officers as a class were men well advanced in years. The additional attention directed to the situation by the epidemics of poliomyelitis and influenza and by the war, and the continually increasing number of requests for assistance in securing physicians for municipalities which were without medical service led to a careful investigation by the Department. This revealed a problem of such character and extent as to require that steps be taken at once for its solution if the fundamental and vital health interests of the State are to be effectively guarded.

The number of physicians in practice in small towns and rural districts is steadily decreasing while the population continues slowly to increase. At the same time the physicians in the rural sections of the State as a whole have been in practice on an average for over twenty-five years, and the number of recent graduates taking up rural practice is far less each year than the number of rural practitioners who die or retire or move into the cities. There were a large number of municipalities (over 160) which had physicians located in them in 1915, which have none now, and a very much larger number of municipalities (over 325) without a single physician, who has been in practice less than 25 years. When residents of rural districts become seriously sick, owing to the lack of physicians, nurses and domestic servants, it is becoming more and more imperative that if they are to receive even ordinary care they shall be removed to a hospital. About one-fourth of the up-state counties have no hospitals within their limits and where hospitals are available they are often inadequate, and generally have not the facilities to give the best kind of medical and surgical service. The American College of Surgeons has approved but fourteen of the thirty-four larger hospitals located in the State outside of New York city. Complete clinical, pathological, chemical, bacteriological and x-ray laboratory service (without which the practice of modern, scientific medicine is impossible) is available in but very few of the rural counties. In large sections of the State containing a numerous population, special examinations and expert consultation service cannot be obtained; and most of the counties are without any general out patient clinics.

To solve this problem the Public Health Council, after much study, prepared the "Health Center Bill"— a measure authorizing and enabling counties and cities to create and maintain health centers. to include one or more of the following parts, viz.: a general hospital, with special pavilions for maternity cases, tuberculosis, etc., laboratories, a public health nursing service, clinics for out-patients, effective school medical inspection and supervision facilities for periodic medical examinations. It also provided for occasional or periodic consultations and clinics by specialists in medicine and surgery to be furnished by the State Department of Health, and state aid in construction and maintenance. In this way it was hoped to provide for residents or rural districts, industrial workers and all others who cannot otherwise secure such benefits, adequate and scientific medical and surgical treatment, hospital and dispensary facilities and nursing care; to assist local medical practitioners by providing laboratory and other service, and thus to attract to and retain in the sections requiring them younger physicians; and in general to improve the health of the inhabitants of the State. The cost would be small and relatively insignificant as compared with the benefits to be secured, and the expenditures would be made in very large measure for the work done and not for administration.

The bill failed of passage in the 1920 legislature, but has been introduced in the present session with certain modifications which have appeared advisable. It may be stated that the Council of Health and Public Instruction of the American Medical Association at a recent meeting has recommended that this association take steps to secure results substantially the same as those it is proposed to secure by means of this measure.

In order to aid rural physicians in obtaining consultation service and diagnostic facilities at the present time, and to furnish such services to those

rural dwellers requiring or desiring such service, a series of group consultation clinics have been held during the year in several of the rural counties of the State. In conducting these clinics the Health Department was aided by the State Education Department, the State Hospital Commission, the State Commission for Mental Defectives, the American Society for the Control of Cancer, the State Charities Aid Association and the Atlantic Division of the Red Cross.

The clinics, which provided x-ray and diagnostic laboratory facilities in addition to consultation service, were held in seven counties. Nearly 2,000 people were examined and advice given, and the reports and results of the examination were sent to the attending physicians. Further details of the operation of these clinics will be found under the report of the Division of Administration.

The work of the Division of Sanitary Engineering calls for a highly specialized service, the demand for and appreciation of which is yearly increasing. The problems and service of the Engineering Division are intimately linked to, and in some instances are inseparable from those of the other divisions of the State Health Department, especially in the investigations of epidemics of typhoid fever and other waterborne diseases. The prevention of the recurrence of these diseases at summer camping places — as for example at the Boy Scout Camp at Interstate Park — by supervision over sewage disposal and water purification plants, is of the greatest importance. The chemical, biological and engineering investigation of public water supplies, and watershed and stream pollution nuisances arising from the operation of various industrial and sewage disposal plants, and other sanitary investigations thus connected with the prevention of disease are everywhere recognized as constituting a very important part of public health work. This work has been actively carried on during the year, and includes with its other activities the supervision of more than 550 public water supplies and 600 milk pasteurizing plants.

In the Division of Laboratories and Research the following readjustments and improvements in organization were effected during 1920: Better standardization of laboratory service throughout the State and coordination of work to the end that diagnostic laboratory facilities should be promptly and uniformly made available; increased production of antitoxins, sera and vaccines to meet greater demands for these products: and improvement of technique in the manufacture of certain of these products. The efficiency of the service of the entire chain of laboratories within the State has been increased. The laboratories of the State Department of Health are now not only the most extensive and best equipped, but are the most thoroughly organized and efficiently administered public health laboratories in the world.

The Children's Health Consultations, the most recently organized feature of the Division of Child Hygiene, were designed to assist in the correction of the weakest point in the general public health situation — the neglected four-year period between infancy and school age. The record of the health status of children upon entrance to school has clearly shown the necessity for protecting the child during these years from the harm caused by insufficient or improper food, decaying teeth, the development of adenoids, diseased tonsils and other diseases and defects, occurrence of the infectious diseases, and unhygienic habits leading to defective physical conditions. The Child Health Consultations have utilized the best of all educational methods, viz., the teaching through demonstration, to carry at a relatively slight cost the most recent scientific knowledge on the subject to mothers resident in remote rural districts. That the need for the work and the desire of the mothers to be instructed were not over-estimated is abundantly proved by the fact that 2.714 children were brought by their mothers to the consultations, and that 76.71 per cent were found to have physical defects, nearly three-fourths of whom should receive attention from a physician if their general health is to be assured.

In the field of public health education, stress has been put on work in rural communities, especially those at a distance from traction and railroad

lines. Child Health Consultations in these localities would have been impossible without the healthmobile, a truck especially designed and equipped for the purpose.

A Manual for Public Health Nurses was issued during the year. This is the first publication covering state-wide public health problems for public health nurses which has been prepared.

A summarized report of the activities of the various divisions of the Department is appended.

Respectfully yours

HERMANN M. BIGGS

Commissioner

March 1, 1921.

Liabilities and Expenditures Chargeable to Fiscal Year July 1, 1919–*June* 30, 1920

	Department, exclusive of division of laboratories	Division of laboratories	Total
Personal service	$256,156 94	$183,809 11	$439,966 05
Maintenance and operation:			
Fuel, light, power and water	....	10,932 14	10,932 14
Printing, including $4,216.86 annual report	56,674 72	6,682 53	63,357 25
Equipment and supplies	35.988 61	84,540 27	120,492 88
Traveling expenses	66,070 73	2,800 00	68,870 73
Communication	12,328 43	7,143 44	19,471 87
General plant service, general	1,581 80	1,446 93	3,028 73
General plant service, care of typhoid carriers	930 06	....	930 06
Rent	3,270 00	1,600 00	4,870 00
Contingencies	24,721 13	16,100 00	40,821 13
Repairs	....	3,863 18	3,863 18
Construction	....	219,718 94	219,718 94
Totals	$457,722 42	$538,600 54	$996,322 96
Federal venereal disease fund:			
Salaries	79,775 81	....	....
Maintenance and operation	23,954 11	....	....
	$103,729 92		103,729 92
Grand total	....	....	$1,100,052 88

Fees for certified copies of birth, death and marriage certificates	$853 92
Fees for registration of laboratories	141 10
Sale of serum	18,48 24
Miscellaneous receipts, rebates, etc	343 85
	$3,187 11

EXPENDITURES — STATE DEPARTMENT OF HEALTH

Fiscal Year July 1, 1919 — June 30, 1920

	Administration	Child hygiene	Communicable diseases	Sanitary engineering	Public health nursing	Public health education	Tuberculosis	Vital statistics	Venereal diseases	Venereal diseases, federal fund	Totals exclusive of laboratory	Total laboratory	Grand total
Salaries	$59,042 01	$13,027 70	*$69,391 59	$28,937 64	$14,790 00	$15,644 67	$8,209 17	$28,674 26	$18,439 90	$79,775 81	$256,156 94	$183,809 11	$439,966 05
Printing and advertising	9,614 53	1,835 40	8,902 87	211 63	445 60	5,420 42	1,969 50	22,161 73	6,113 04		56,674 72	6,682 53	63,357 25
Equipment and supplies	8,505 98	462 93	1,329 25	2,217 96	157 10	5,413 03	3,829 16	5,296 56	10,776 65		35,988 61	84,504 27	120,492 88
Traveling expenses	4,438 89	6,509 10	19,771 74	5,782 63	13,473 46	6,011 74	1,184 59	273 06	8,625 52		66,070 73	2,800 00	68,870 73
Communication	3,248 02	1,003 06	1,502 08	1,003 06	1,002 06	1,234 96	1,002 06	1,501 09	832 04		12,328 43	7,143 44	19,471 87
General plant — general	30 35			184 80		116 10	45 35	1,205 20			1,581 80	1,446 93	3,028 73
Care of typhoid carrier			930 06								930 06		930 06
Rent	3,270 00									28,954 11	3,270 00	1,600 00	4,870 00
Totals	$88,149 78	$22,838 19	$101,827 59	$38,337 71	$29,868 22	$33,840 92	$16,239 83	$59,111 90	$44,787 15	$108,729 92	$433,001 29		
Influenza epidemic			24,721 13								24,721 13		24,721 13
			$126,548 72								$457,722 42		
Fuel, light, power and water												10,982 14	10,982 14
Repairs												3,863 18	3,863 18
Venereal disease bureau, contingent												16,100 00	16,100 00
Construction												219,718 94	219,718 94
											$456,076 46	$538,600 54	$996,322 96
Federal venereal disease fund													108,729 92
Grand total													$1,100,052 88

* Includes salaries of District Sanitary Supervisors who also cover special assignment for other divisions.

SUGGESTIONS FOR LEGISLATIVE ACTION

Prepared by the Public Health Council and Recommended by the Commissioner of Health

Memorandum as to recommendations in regard to certain legislation which should be enacted at the present session of the Legislature.

1. In the last annual report attention was drawn to the situation existing in rural counties of the State with reference to medical service for the care of the sick. It was then pointed out that the number of practicing physicians in strictly rural districts was steadily decreasing; that younger graduates in medicine were not coming to country districts; that the average age of the present physicians practicing in such districts was so high that a most serious deficiency in the medical service available would almost certainly develop in the near future. It was further pointed out that in the opinion of the Public Health Council, one of the chief reasons for this condition was the lack of those facilities in rural districts which are necessary to enable the physicians there located to practice medicine in accordance with the developments of modern science.

At that time it was recommended that a law be enacted which would give local authorities power to establish health centers including hospital, laboratory, out-patient clinic, special pavilion for maternity cases and communicable disease, and which would provide adequate facilities for the treatment of the people of these rural districts, and which would form a nucleus around which all the health activities could converge, and which would also provide physicians through the State Department of Health with consultation service and laboratory and other facilities not now available.

To encourage the establishment of such centers it was urged that the State pledge itself to grant certain definite financial assistance in proportion to the amounts expended by the respective municipalities.

A bill embodying these purposes, known as the Sage–Machold bill, was introduced in the 1920 session of the Legislature, but failed of passage. More extensive and intensive study of the subject made since that time has merely served to re-enforce the opinions then expressed as to the necessity of some action being taken in the near future to supply for the inhabitants of rural districts facilities for adequate and scientific medical and surgical care.

The enactment of legislation in accordance with the suggestions herein made is therefore once more recommended.

2. Frequently in the past attention has been drawn to the necessity of concentrating and co-ordinating the health activities throughout the rural localities of the State. All through the State there are many small districts with underpaid health officers, who can devote only a very small part of their time to health work. The consolidation of districts, which is permitted by a law advocated by this Department and passed several years ago, has done something to remedy conditions. It is felt, however, that the time has come for taking further action in this matter and it is therefore recommended that the Legislature authorize the establishment of counties or major parts thereof as health districts with competent, full-time health officers in charge of the enlarged districts.

3. The workings of the law in reference to the consolidation of health districts has developed one imperfection. Members of the consolidated health boards are paid nothing for their services, and are not even allowed their necessary expenses for traveling to attend the meetings. It has therefore become difficult to obtain sufficient attendance at the board meetings.

Recommendations are therefore made that the law be amended so that members of the consolidated health district boards may receive the same fees that are allowed members of town and village boards, together with their actual expenses incurred in attending meetings.

4. The Domestic Relations Law requires the State to furnish to counties all blank licenses, registrar books and other stationery required in the recording of marriages. It seems just that the localities themselves should bear this expense rather than the State and legislation carrying into effect this suggestion is therefore recommended.

5. Under chapter 411 of the Laws of 1917 municipal laboratories are exempt from registering and complying with the other provisions of this law. This exception has lead to confusion and recommendations are therefore made that municipal laboratories together with private laboratories be required to register under the provisions of such law.

6. In 1920 the Legislature passed a law authorizing the establishment of district laboratory supply stations. The law has worked satisfactorily, except where the district was made to include more than one municipality. Under the law as it now stands, the officer in charge of such laboratory district is obliged to collect from such municipality its proportionate share of the expenses of the district. This leads to delay and confusion. It is therefore recommended that when the district covers more than one municipality that the expenses be paid in the first instance by the county and that the board of supervisors then assess back to each municipality included in the district its proportionate share of the expenses.

SUMMARY OF WORK OF DIVISIONS

DIVISION OF ADMINISTRATION

The Division of Administration through its executive officers outlines the policies of the Department, enforces the Public Health Law, carries out the provisions of the Sanitary Code, maintains oversight over the work of the various divisions, supervises the work of local health authorities and performs such other duties in the promotion of public health as do not fall naturally to any one of the other divisions.

Health Officers' Courses

The qualifications for health officers adopted by the Public Health Council require that all health officers unless specially exempted shall possess or obtain a certificate from an educational institution giving an approved course in public health. In New York State such courses are given by the University of Syracuse, University of Buffalo, New York University and the Albany Medical College. Sanitary Supervisor Sears is director of the Syracuse course, Sanitary Supervisor Duryee of the Albany course and Dr. Marsh of the Venereal Disease Division is Assistant Director of the New York course. Members of the staff of the Department constitute part of the faculties of these courses.

A total of 333 health officers representing 497 municipalities have thus far completed an approved course, while 131 health officers representing 165 municipalities are now taking such courses. These figures do not represent the total registration as many physicians not health officers have received certificates.

Consolidated Health Districts

During the year 18 health districts have been consolidated. By such consolidation it has been possible to secure greater co-ordination and efficiency. A total of 1,339 health districts are now represented by 1,000 health officers.

Adoption of Model Sanitary Code

A total of 760 boards of health of towns and villages are now governed by the Sanitary Code regulations recommended by the Department.

Annual Conference of Health Officers and Public Health Nurses

The Annual Conference of the Department with the health officers and public health nurses of the State was held at Saratoga Springs, September 7, 8 and 9. This constituted the nineteenth annual conference of health officers and was the second conference at which the public health nurses of the State took part. Five hundred and forty-three health officers representing 689 health districts and 257 public health nurses attended the Conference. The total attendance including guests, members of the staff, etc., was 990. Many representatives of private health organizations were present by invitation.

Among the prominent visitors and speakers were Dr. John Amyot, Deputy Minister of Health, Dominion of Canada; Dr. Abraham Zingher, Research Laboratory, New York City Department of Health; Dr. Milton J. Rosenau, Professor of Preventive Medicine, Harvard Medical School; Mrs. Nettie Hewitt, President, State Federation of Women's Clubs, Carthage; Dr. Thomas D. Wood, Director, Department of Physical Education, Teachers' College, Columbia University, New York City; Dr. William A. Howe, State Medical Inspector of Schools; Miss Frances Perkins, Commissioner, New York State Industrial Commission; Miss Florence Wright, R. N., National Organization for Public Health Nursing; Dr. Charles V. Chapin, Superintendent of Health, Providence, R. I.; Dr. W. E. Studdiford, Professor of Obstetrics, College of Physicians and Surgeons, New York City; Dr. Thomas Ordway, Dean, Albany Medical College; Dr. I. S. Wechsler, Chief Neurolo-

gist, Vanderbilt Clinic, New York City; Dr. William C. Sandy, Psychiatrist, New York State Commission for Mental Defectives; Dr. Josephine Baker, Director, Division of Child Hygiene, New York City Department of Health; Mr. Everett Elwood, Secretary, New York State Hospital Commission; Miss Anna Ewing, R. N., Director, Public Health Nursing, Atlantic Division, American Red Cross.

In connection with the conference there was an exhibit of books and pamphlets of value to public health nurses including special groups of books such as "A Library in a Brief Case," "A Library in a Handbag." Many of these books and pamphlets are available for the use of public health nurses in the state medical and other libraries. By special arrangement with the State Department of Education, the State Medical Librarian was in attendance at the exhibit for a large part of the time.

A model illustrating the value of the Health Center to the rural district was also shown.

GROUP CONSULTATION CLINICS

The State Department of Health, in co-operation with the State Education Department, the State Hospital Commission, the State Commission for Mental Defectives, the American Society for the Control of Cancer, the State Charities Aid Association and the Atlantic Division of the American Red Cross, inaugurated a series of group consultation clinics to be held in several of the counties of this State.

Realizing the difficulty which the medical practitioners in the rural districts encounter in the practice of their profession, the State Department of Health endeavored to render them the aid that could be given by a group of consulting physicians, assisted by a diagnostic laboratory and x-ray plant for the purpose of consultation along diagnostic lines, in their difficult and obscure cases.

The first of these clinics was held in Geneseo, N. Y., for Livingston county in June, with the result that 462 patients were examined and 657 consultations were held.

The second clinic was held in July for Chenango county, in Norwich, N. Y., the result being that 438 patients were examined and 874 consultations were held.

The third clinic was for Orange county, held in August in Goshen, N. Y., 314 patients being examined and 567 consultations held.

The fourth clinic for Jefferson and Lewis counties, was held September 30, October 1 and 2, in Carthage, N. Y., 319 patients being examined and 726 consultations held.

The fifth clinic was held in Walton, N. Y., for Delaware county, where 71 patients were examined and 172 consultations held.

The sixth and last clinic was held for Putnam county at Brewster, N. Y., in January, 1921, where there were 131 patients examined, and 292 consultations held.

The total population served in the seven counties covered, (and a portion of two adjoining counties), was 325,474; total number of patients examined being 1,735 and total number of consultations, 3,288.

There were 88 different consultants sent by the Department of Health to do this work and 39 different nurses sent by the Department assisted by 27 local nurses aided in the field and clinic work.

The first four clinics were of a type which employed general publicity. The general public were invited to attend the clinics, to be examined, admission being secured by cards signed by their attending physicians. The last two clinics were of a type in which no publicity whatever was used, except through the physician, and the physician was invited to refer only those cases upon which he desired to have consultation.

DIVISION OF COMMUNICABLE DISEASES

It is difficult adequately to present and evaluate the work of the fifteen sanitary supervisors of the State. The effects of their work are in the main to be found in the resultants of complex forces. The educational and industrial status of a community, its wealth, intelligence and the extent to which a progressive community spirit has been developed, all have a marked effect on the rapidity and extent of progress in the conservation of health. We have our precocious, normal and retarded among the communities of the State as among the pupils of our schools and the somewhat uninspiring work of raising one of the former to a position of safety to its neighbors is perhaps more important than developing the utmost that there is in the latter.

The sanitary supervisor is the field representative of the department in all the phases of its work. While his first duty is to limit the spread of communicable diseases to the community within which it arises and to as few people as possible in that community, he is expected even more to raise the health administration of such a place to a position of justifiable self-reliance. This is the foundation upon which the superstructure of other not less important activities is to be built. He promotes the cause of child welfare, of venereal disease control, of improved water supplies, of safe sewage disposal, of better laboratory facilities, of adequate nursing service and of tuberculosis hospitals, dispensaries and clinics. As means to these ends he secures the cooperation of the press, and addresses meetings of clubs and associations and gatherings called together specifically for the consideration of public health questions. He attends meetings of medical societies, confers with town and village boards, interviews city officials and maintains contact with voluntary organizations interested in the advancement of public health. Through correspondence, through monthly reports, through the weekly summaries of disease prevalence, through copies of department letters to them, and through at least one personal visit to each district during the year he keeps in touch with the work of his health officers, stands ready to advise and to assist them in every way compatible with community self-respect. A mere catalogue of his duties would occupy the space allotted to this summary and when it is remembered that most of these duties have been performed not once but many times during the calendar year, the inadequacy of the following brief statement may be appreciated.

During 1920 the sanitary supervisors made 476 visits on account of communicable diseases. These visits have been for purposes of diagnosis in doubtful cases, to advise in the management of outbreaks, to conduct epidemiological investigations and in some instances to bring local authorities to a sense of their responsibilities. With the exception of such exotic infections as Asiatic cholera, yellow fever and the like, these investigations have included practically every disease listed as communicable in the sanitary code. This work necessitates not only a broad knowledge of practical epidemiology, but a high degree of diagnostic ability as well. It is not surprising therefore that the sanitary supervisors have been, on occasion, the means of correcting mistakes in diagnosis and thus directing treatment along lines that have promptly resulted in recoveries. An instance of this was afforded not long since when a supervisor was called to see a suspected case of poliomyelitis. His examination resulted in a diagnosis of infantile scurvy which yielded, as such cases usually do, to an appropriate diet. While the treatment of the sick is not a regular part of the sanitary supervisors' duties (except, for example, the administration of some specific serum involving a technique with which many physicians are unfamiliar, as in the intraspinal administration of antimeningococcus serum), yet occasional instances such as this serve perhaps better to demonstrate the value of their services than the many cases of sickness their activities prevent.

Six of the sanitary supervisors gave local direction to healthmobile tours in their districts, assisting with the children's examinations and speaking at the accompanying meetings. This work has had the important advantage of bringing to the health officers and public of the rural districts a form of

health conservation usually found only in the cities. Altogether the supervisors have promoted, directed or assisted in the conduct of 294 clinics, of which 121 were for child welfare, 65 for tuberculosis and 108 for miscellaneous classes; 99 of the child welfare clinics were held in connection with the healthmobile.

The sanitary supervisors assisted with advice and direction 397 public health nurses, including many employed by voluntary organizations as well as by public authorities. An important part of the sanitary supervisors' work is stimulating the employment of public health nurses by local boards of health, explaining the functions that such nurses perform and the advantages that may be expected. Two hundred and eighty-nine conferences with members of town and village boards have been held covering practically every activity that such boards may consider. In addition 194 meetings of other organizations have been attended in one capacity or another and there have been held 1,134 miscellaneous conferences with individuals on public health matters. The purpose of these conferences has been usually to direct properly the activities of voluntary organizations engaged in health work, coordinating the activities of public and private agencies.

The sanitary supervisors have given 335 addresses, which have ranged from talks to school children to technical discussions before medical societies. They have attended 89 meetings of medical societies in practically all of which they have presented either in an original paper or in the discussion the public health side of some medical question. Ninety-three complaints have been investigated, most of them on account of local nuisances. As complaints requiring investigation are usually evidences of weakness in local health administration it is gratifying to find that they are not more numerous and that there is evidence of their growing fewer in number from year to year.

During the year seventeen consolidations were affected, the largest number for any year since the consolidation law went into effect, with the exception of 1916. These consolidations have been accomplished usually only after considerable effort has been expended in educating local boards of health. While in themselves they mean little, consolidated districts do afford a better foundation upon which to build later an effective local health organization. By having a larger area and population the overhead is reduced and the employment of a public health nurse, for example, which neither district could afford separately may be economically handled by the combined resources.

Of the 965 health officers of the State, 845 have been visited at least once, the supervisor going over with each individual his records, supplies and local problems. With very few exceptions a report has been made covering the salient features of each health district in the State. The large number of health officers included in each supervisor's territory and the difficulty of reaching the more remote ones at a time when the health officer was at home has been the only reason that the score has not been perfect. A special effort has been made to visit each new health officer soon after the receipt of notice of appointment not only to give him instruction in his duties but that the Public Health Council might have an intelligent and unprejudiced report on the applicant's qualifications. In every instance before taking final action on health officers who have been delinquent in the performance of their duties, the sanitary supervisor has made one or more personal visits in an effort to correct the faults. With rare exceptions they have been successful, and in only a few instances has it been found necessary to institute further proceedings.

The scoring of cities which was begun in 1918 has been continued and the results are justifying the time spent upon it by the sanitary supervisor to whom this work is assigned.

The post-graduate courses for health officers conducted in connection with the Albany Medical College and Syracuse University have been directed by two of the sanitary supervisors. The Albany class for this year comprised 50 students who completed the course; the Syracuse 34. Practically all the health officers in the central part of the State have taken the Syracuse course

during the four years it has been running, this accounting for the small classes for 1920. The value of these courses is attested both by the better work done by the graduates and by the fact that many of those who have completed the course return to attend additional lectures in subsequent years.

There were 168,572 cases of communicable disease reported to the department during the year 1920, a considerable increase over the preceding year. Of these 58,746 were influenza cases, which disease prevailed quite extensively during the latter part of January and until the first week of March. The peak of the epidemic was reached in the second week of February during which 13,259 cases were reported. The first notice of an extensive prevalence of influenza in 1920 was from Chicago and certain other mid-western cities. This mid-western outbreak preceded the epidemic in New York State by about ten days.

Coincident with the rise in influenza there was a very nearly parallel rise in the incidence of pneumonia. The decline of pneumonia was, however, much more gradual than that of influenza and it was not until the latter part of March that the normal rate again prevailed.

Typhoid Fever

The number of reported cases of typhoid exceeded the number for the preceding year by a very small margin. The cases were much fewer than in preceding years until the middle of April when reported cases were much increased by outbreaks occurring in Schenectady, Mt. Vernon and Mechanicville. The two former were traced definitely to pollution of the public water supplies. There was an extensive outbreak in Seneca Falls in September traced to the infection of the public water supply through the cross connection with a private supply of an industrial plant. A smaller outbreak of the same nature occurred in Amsterdam in November. An outbreak of 30 cases among the students of Niagara University commencing about the first of April was traced to infection of the university milk supply by a carrier employed as a milker. An outbreak of seven cases in Oswego was promptly traced by the health officer to a small milk supply, the carrier discovered and the supply discontinued.

Smallpox

There was a considerable increase in the number of reported cases of smallpox due largely to successive importations of the disease from Canada. The disease was most prevalent in Buffalo, Niagara Falls and vicinity. A well marked outbreak occurred on the St. Regis Indian Reservation and surrounding territory in March. There were small outbreaks in Ithaca and Elmira, the latter due to the presence of an unrecognized case of the disease in a general hospital. The outbreak in Brockport which began in December, 1919, terminated about the first of February.

Measles and Scarlet Fever

Measles prevailed extensively throughout the State during the spring, being especially prevalent in Oswego, Fulton and nearby places in Oswego County. Until it is possible to secure better control of non-immune contacts in this disease there is little hope of reducing its epidemicity. After the usual summer decline the disease began to rise rapidly in October, though it has not yet reached the widespread prevalence of last spring, Binghamton has been most affected by the fall rise.

The only scarlet fever outbreaks demanding particular attention have been those in Middletown and Mechanicville. The former was brought under control within a few weeks after proper measures were instituted. The outbreak in Mechanicville which began in December, 1919, did not attract the attention of the Department until the fall. Its continued prevalence demonstrates that the disease does not tend to die out naturally. Since the cooperation of the school nurse was secured in searching out contacts and mild cases a decline has been observed which seems to forecast the early disappearance of the disease. It is hardly to be expected that a part time

health officer receiving 10 cents per capita will devote the time necessary to searching out "missed" cases and their non-immune contacts and placing them under proper restrictions.

Diphtheria

Diphtheria was the only one of the common communicable diseases which showed a decline from the preceding year. As in 1919 an undue proportion of the cases have been from Erie County. The disease has been very prevalent in Buffalo and vicinity for over two years, furnishing about 36 per cent of the entire diphtheria morbidity of the State.

A milkborne outbreak of diphtheria occurred in Westchester County and was traced to an unpasteurized certified milk supply. Although a number of carriers were found in and about the farm no definite conclusion could be reached as to the actual persons infecting the milk.

Through cooperation with the State Medical Inspector of Schools the Department has distributed to all the rural schools of the State forms designed to facilitate the control of communicable diseases. While in the past samples of this material have been distributed and some effort made to further its use, the high cost of printing the material in small quantities, together with the lack of sufficient stimulation has prevented their use becoming general. During the early part of the year one of the epidemiologists was detailed to visit the larger villages of the State to explain the workings of the system to the local health and school authorities. It is believed that these forms are now in a fair way to come into general use and that better control will be obtained of those communicable diseases which especially affect children.

DIVISION OF LABORATORIES AND RESEARCH

The year 1920 with its general social unrest, its fluctuating prices and steadily increasing costs has been a year of continued adjustment, reorganization and standardization among the different departments and groups of the laboratory, as well as a year of increased routine work.

Public health work everywhere has received a great impetus. Nearly five million of our men drawn into the Army or Navy have seen and learned much concerning modern methods of preventive medicine. They have returned to their homes imparting this new knowledge to their families and friends and consequently, much more than formerly, the laboratory is now generally recognized as the foundation of all effective public health work.

The lack of laboratory facilities, however, has made the practice of medicine according to modern standards difficult in rural districts. Capable young graduates in medicine stay in cities where they can have the advantage of the best facilities, and rural communities suffer accordingly. The leaders of the profession recognize the situation as a serious menace to the public health and have actively considered remedial measures. These remedies all turn to legislative aid and follow in principle the provisions of the health center bill introduced last year by Senator Sage and Assemblyman Machold. The development of laboratory and hospital facilities throughout the State is the aim of this legislation and nothing will contribute more toward the health and happiness of the people of the State generally than its speedy enactment. Iowa, Michigan and several other states have taken, or will soon take, steps in this direction, and the American Medical Association is now considering the advisability of a general campaign throughout the country in support of legislation based upon these principles. The Division of Laboratories and Research with its present organization, if adequately supported, is fully prepared to aid in the establishment of local laboratories anywhere in the State.

Diagnostic Laboratories

In the meanwhile, whatever new work is undertaken, or however the laboratory service is extended throughout the State, the routine procedures, for the performance of which the Division of Laboratories and Research is primarily established and maintained, must go on. The standards of excellence must be kept up, and more and more, the organization within the laboratory groups perfected so that the resources at command may be applied to the best advantage. The growth in routine activities may be seen in the statistics from the Diagnostic Laboratories. The examinations have increased from 146,993 in 1919 to 201,441 in 1920; the distribution of diagnostic outfits from 169,109 to 190,965. The number of examinations for tuberculosis has doubled, and practically also, those for the diagnosis of venereal disease. This large number of examinations made during 1920 is an important indication of the way in which the expenditure of appropriations has reacted in more adequate protection to life and health. In particular, a greater number of complement fixation tests for syphilis have been made during 1920 than were made in any other year for all other tests combined. The outfits for collecting specimens are expensive, and the performance of the test is costly, but it does not seem possible to overestimate the value of these examinations in connection with public health. Only by perfecting the organization of the diagnostic laboratories was it possible to handle this large number of examinations.

Antitoxin, Serum and Vaccine Laboratories

The Antitoxin, Serum and Vaccine Laboratories show very marked increase in production and distribution of nearly all biological and chemical preparations, this being especially true of diphtheria antitoxin, outfits for the Schick test, diphtheria toxin-antitoxin mixture, bacterial vaccines and arsphenamine. At the same time progress has been made in the standardization and more

efficient organization of the work, and in improvement in technical procedures through investigations carried on in conjunction with the routine production. More trained workers with a knowledge of the chemical and physiological problems connected with the manufacture of biological and chemical preparations are required but can not be secured until the salaries offered more nearly approximate those in other laboratories.

The federal requirements for activities in these laboratories can not be lived up to without additional appropriations to provide a separate building for work with the pathogenic spore-bearing anaerobes, bacillus tetanus, bacillus botulinus, etc.; new stable units for the horses; quarters for small animals; a sufficient staff to meet these requirements adequately and increased facilities for filtering, filling, boxing and storing materials. The items for new construction in the budget were requested largely, if not entirely, for the purpose of conforming to these federal standards. Nevertheless, the staff have succeeded in attaining the highest standards in quality despite the hazards which are taken in their preparation of these products. Other states and municipalities and also several foreign countries have requested the privilege of purchasing our surplus serums. None of the therapeutic products can be sold in interstate commerce without a federal license.

Analytical Laboratories

In the laboratories for water analysis also an increased number of examinations were made in 1920 as compared with those of the year 1919. The laboratory has been able materially to help the Engineering Division in its inspection of water supplies which are dependent upon artificial methods of sterilization by making frequent examinations of samples from such supplies. This work of cooperation can and ought to be most advantageously developed.

Besides the usual number of special examinations made by the analytical laboratories for health officers and physicians, many analyses and tests of raw materials and of finished products have been done for other departments of the laboratory. Much time and thought have also been spent by Mr. Wachter and his assistants in working out details and supervising the installation and adjustment of the larger apparatus in the laboratory.

General Service Groups

In the other laboratory groups which generally serve the scientific staff — the departments preparing media and other supplies, and those recording and reporting results — in fact, everywhere the increase in the activities of the scientific workers is especially reflected. Throughout the laboratory improvement in organization is apparent. Particularly, progress has been made in systematizing and correlating various phases of office and administrative management, and in improving the procedure required of those undertaking research work, the method of recording scientific papers and research work, and especially in bringing the resources of the library to bear more effectively and directly upon the various branches of scientific inquiry.

The organization of an institution continually growing and expanding in unforeseen directions, to say nothing of being conditioned by legislative restrictions or Civil Service regulations, can never be considered complete, but the foundations have been securely laid, and the work of organization within the groups, correlation of the Laboratory with other divisions of the Health Department, and inspection and supervision of local laboratories go steadily forward.

Opportunities for Training Workers

Exceptional opportunities are provided in the laboratory for training laboratory workers. Standard methods for the technical procedures are available; library facilities and opportunities for research are given, and arrangements have been made for those coming from a distance to familiarize themselves, for longer or shorter periods, with the work of the laboratory.

Supervision of Local Laboratories

The Division of Laboratories and Research has thus been forced to devote the major part of its resources and energy to carrying on the increased work, and to perfecting its own organization, but it must now turn more and more actively to the development of local laboratories throughout the State.

The provisions of the Public Health Law and Sanitary Code of the State, together with public sentiment and the drift of recent legislation, imposes upon the Division of Laboratories and Research very definite obligations. All laboratories handling pathogenic microorganisms must register January 1, each year, with the Commissioner of Health and his approval must be secured for the shipment or distribution of cultures of the virulent, disease-inciting microorganisms to other laboratories or persons. All the laboratories of the State, outside the Greater City of New York, that are engaged in public health work now operate under the supervision and control, and with the cooperation of the State Laboratory in Albany. Standards of laboratory work must not only be maintained but also advanced whenever and wherever necessary.

During 1920 the work of inspection and supervision of local laboratories has been actively carried on with encouraging results. The number of such laboratories approved during 1920 was 64, an increase of 34 over 1919. This means that this number of laboratories have brought their activities into conformity with the State Laboratory standards, a fact to be emphasized. It is desirable that local laboratories, as far as possible, perform the diagnostic tests for the physicians of their respective localities.

Besides inspecting the local laboratories and advising the persons in charge, the State Laboratory has sent out workers where for any reason there has been a shortage of help. From time to time representatives from these laboratories of the State, and also from other states, or even foreign countries, have been trained in the Albany laboratory. Each year several members of the staff have taken important positions in other laboratories. Thus, although only a beginning has been made, training of laboratory workers has gone hand in hand with the standardization and consolidation of all the public health laboratory work of the State, and the Laboratory's sphere of influence has also been extended beyond the borders of this State.

New York State Association of Public Health Laboratories

The New York State Association of Public Health Laboratories now holds two meetings each year — one with the State Medical Society at its annual meeting, the other at the State Laboratory at Albany.

Work of the Assistant Director

No summary, however brief, of the laboratory work for 1920 would be complete without mention of the valuable aid given by the Assistant Director, Dr. Paul B. Brooks, who has had general supervision of the various field activities, and who has increased the usefulness of the laboratory service in many directions throughout the State by promoting, organizing and extending the activities of local laboratories whenever occasion offered. He has represented the laboratory at numerous official conferences, during the year, has assisted in connection with three courses in public health and has served with the group consultation clinics given under the auspices of the Department of Health. He has thus generally cultivated a spirit of friendliness and cooperation on the part of health officers and other physicians who look to the main laboratory for service. Besides these outside activities, he has taken charge of a number of routine matters and administrative duties with the laboratory in Albany and been active in promoting operation between the Division of Laboratories and Research and the other divisions of the Department.

Research.

Research for the year has included more work than usual along immediately practical lines, namely, investigations toward the improvement of technical procedures, such as the preparation of media, the production of biologic and

chemical products and the performance of the complement fixation test. Besides, studies have been completed on the classification of the meningococcus, and the preparation of antimeningococcus serum.

Twelve papers were prepared and accepted for publication and a number of others will be ready in the near future. So far as possible the work in connection with research and investigation — the required forms for preliminary outlines, for reports of progress, and for the finished papers — has all been formulated.

Not only for the effect of research upon the work of the Laboratory but because many laboratory questions relating to the cause, prevention and cure of the infectious diseases are still unsettled, the laboratory is continually obliged to plan for some researches in order to determine the facts upon which action should be based.

Early in the year an attempt was made to conserve the appropriation for equipment and supplies by holding a reserve and keeping to a monthly allowance, but despite this retrenchment, January 1st, $53,306.68 had been spent, leaving a balance of $30,693.32, and thus an unavoidable minimum deficiency of $23,000. No new technical positions have been allowed and all outside supplementary funds have been devoted to providing the scientific staff with clerical and library assistance to conserve their time for their technical and scientific work. Inspection and supervision of the approved local laboratories has been temporarily dropped. The upkeep of the buildings and grounds has been reduced to a minimum, below the allowance for safety if continued. The entire staff has been put on an eight hour day instead of the usual seven hour day of all other state departments.

The stress of this situation has left the Laboratory with a deficiency for supplies and average salary of $1,257, which when compared with the present average salary of six other state departments, $1,871, accounts for labor turnover during 1920 of 61 per cent.

Without the loyal and able assistance of the staff, and even great sacrifices on the part of many of them, it would have been utterly impossible to accomplish the tasks that have been set before us during the last two years. The chief problem of the future is now clearly defined. Every effort should be directed toward the development of local laboratories, the establishment of new ones in inaccessible districts, the expansion of those which have been longer established and more efficient to serve larger districts, and the support of the smaller local laboratories which are continuing their work under great handicaps. The Division of Laboratories and Research with adequate support is now prepared to cooperate in this important work. Apart from the correction of the serious discrepancies in salaries and appropriations for maintenance, it was largely for this purpose that the increases in the budget were requested.

DIVISION OF TUBERCULOSIS

During the year 1920 the Tuberculosis Division has carried on an intensive tuberculosis campaign throughout the State. These activities have consisted in conducting clinics in many counties for the recognition of early tuberculosis, the supervision and inspection of tuberculosis hospitals and clinics, the inspection and standardization of tuberculosis boarding houses and the inspections of new sites for county tuberculosis sanatoria. The Division has also cooperated with other tuberculosis organizations, agencies and various local tuberculosis committees.

In New York State alone there has been a yearly average of 6,300 deaths from all forms of tuberculosis during the years 1915 and 1919 inclusive. Taking an arbitrary figure of six active cases for every death, there probably are, at a conservative estimate, some 37,000 active cases of tuberculosis in the State (exclusive of New York City), of which only 11,000 are recognized and reported. It has been proved time and again that if the disease is recognized in the early stages and properly treated a large proportion of cases are curable, and one of the chief activities of the Division has been personally to conduct, assist and supervise tuberculosis clinics in nearly every county in the State, with the result that these clinics have been instrumental in detecting a high percentage of this appallingly great number of previously unrecognized cases.

Summarizing briefly, since January 1, 1921, 657 tuberculosis clinics have been conducted in 39 counties by the State Department of Health and by various state and local organizations. Reviewing the clinic results it is found that of 7,738 patients examined, 1,601 or 21 per cent were discovered to have been suffering from tuberculosis, while 1,863 or 24 per cent, were suspicious or needed further study, repeated examinations or additional laboratory analysis before definite diagnoses could be reached.

This Division, with a comparatively small staff, has personally conducted 63 clinics in 21 counties, with the following results: Of 2,368 patients examined, 417 were found to be positive; 736 suspicious, and 1,215 negative.

As a direct result of these clinics, it is gratifying to learn from reports of field workers, that a large percentage of positive cases are at present receiving treatment in county or private sanatoria, or are taking the cure at home under a physician's care in cooperation with the public health nurses in the various communities. The nurses working in the field report that in so far as it has been possible to trace patients examined at the clinics, 530 have received sanatorium treatment; 1,459 are under supervision at home, and 993 have returned to their former occupations, or in the case of children, have resumed their school duties.

During the past year an x-ray department has been established in the Division, a technician appointed, a portable x-ray machine purchased and a dark room equipped for developing x-ray films. This additional feature has proved very practical and has been the means of aiding very materially in diagnostic work, not only in the tuberculosis clinics, but also in the group or consultation clinics which have been conducted by the Department in several counties. Since June, 1920, when this activity was begun, 1,178 x-ray films have been taken of patients examined at the clinics. The greater number of these were chest cases; others consisted of films of various bones, sinuses, joints, teeth and other parts of the body. A number of state employees have been x-rayed in addition to the patients at the clinics. A detailed report of the clinic examination was forwarded in each case to the family physician. This report comprised the result of the physical examination with complications, laboratory report and x-ray interpretations noted, together with recommendations. A complete filing system covering this work is in operation. The report of the examination of each patient, together with the x-ray findings, will be kept on file in the Department for follow-up work, to be used at re-examination or in case further information is requested by the family physician.

During the fiscal year five large county tuberculosis hospitals have been completed, equipped and opened to receive patients. The services of full-time superintendents have been secured in each instance — a most desirable arrangement as contrasted with the part-time men engaged by the smaller institutions. With the opening of the above institutions, the present hospital capacity available in the State is 3,827 beds, exclusive of New York City. This represents an increase of 488 per cent of bed capacity since 1910, when there were only 650 beds available — a very gratifying showing.

In 1906 the first municipal tuberculosis dispensary was established in Yonkers. Today there are 49 tuberculosis clinics and dispensaries in New York State, exclusive of New York City. The number is increasing yearly and excellent results are being obtained.

The field agent of the State Department of Health has rendered valuable service in the inspection of new institutions and reinspection of sanatoria already in operation. In all, 24 inspections have been made, and in addition assistance has been given with reference to plans of new buildings, or constructive changes in others.

There are at the present time 52 county tuberculosis nurses in the State devoting their entire time to county work, three serving part time, and 19 executive secretaries. In addition there are approximately 189 nurses employed by public or private organizations engaged in tuberculosis work in the various municipalities. The value of the service of these nurses can not be too greatly estimated, for little could be accomplished if we did not have county tuberculosis nurses available for the rural sections, and the public health nurse for the towns and cities, in order to effectively carry on the work so that all tuberculous patients unable to take sanatorium treatment will be under proper supervision in their homes.

The Department has been instrumental in securing many new appointments of local and county nurses since the beginning of the year. The Division has cooperated with the Civil Service Commission in conducting examinations of applicants for superintendents, assistants and county tuberculosis nurses. Lectures on the subject of tuberculosis have been given in connection with the health officers' course at the Albany Medical College. A special three weeks summer course on tuberculosis was conducted as usual at Ray Brook Sanatorium for superintendents of county tuberculosis hospitals.

Reviewing the mortality statistics from tuberculosis in New York State there is observed a marked reduction in the death rate from 1919 to November 1, 1920. This is unquestionably a direct result, in part at least, of the antituberculosis activities which have been so intensively waged from year to year. During the year 1919 there was 2,621 fewer deaths from tuberculosis than the preceding year, and there is every reason to believe that there will be a greater reduction during 1920.

An enormous economic saving will be effected for the State if the present tuberculosis activities are continued.

DIVISION OF PUBLIC HEALTH NURSING

The Division of Public Health Nursing during the year 1920 has been able to cooperate in the activities of the Department and supply the demands made upon it by the other divisions with increasing satisfaction as the following résumé gives evidence:

1. The appointment of a director of the division.
2. Increase of the staff of supervising nurses.
3. Provision of public health nurses for Indian Reservations.
4. Reorganization of the work of nursing staff.
   a. Seven nurses continue to devote full time to special work.
   b. Nine supervising nurses have been assigned to districts in the State corresponding to those of the sanitary supervisors.
   c. Four public health nurses are assigned to five of the Indian Reservations in the State.
   d. Six nurses and two muscle testers continue to give aftercare to poliomyelitis cases.
5. Increased number of municipalities have secured appropriations for public health nurses through demonstration given by nurses of the department staff.
6. Supervision and coordination of activities of public health nurses throughout the State.
   a. Organization and standardization of increasing number of county tuberculosis nurses.
   b. Cooperation and demonstration in securing and organizing nursing service with Boards of Supervisors; city, town and village Boards of Health; and private and semi-private organizations.
   c. Cooperation in the nursing activities of the State Department of Education; State Hospital Commission; State Commission for the Blind; State Board of Charities; American Red Cross; State Charities Aid Association; and the National Organization for Public Health nursing.
7. Supervision of and instruction to 520 midwives in the State. Inspection and supervision of 47 day nurseries.
8. Organization of adequate nursing service for the following divisions:
   a. To give assistance to the Division of Administration in educational work and in conducting the group consultation clinics.
   b. To the Division of Tuberculosis.
   c. To the Division of Child Hygiene.
   d. To the Division of Venereal Diseases.
   e. To the Division of Communicable Diseases.

The appointment of a director of the division and additional supervising nurses makes it possible more adequately to supply the increasing demands made upon the Department for supervision and instruction of local public health nurses, and for assistance in securing competent ones. The demand is constantly increasing and there are now over 1050 public health nurses in the State, exclusive of New York City, employed by boards of supervisors, local boards of health, State Charities Aid Association, American Red Cross, and other private and semi-private organizations and industries.

Health surveys of the Indian Reservations during the last two years gave evidence to the fact that instruction and demonstration in the care of the sick was very essential and four nurses were placed on five of the Indian Reservations. The Tonawanda and Tuscarora Indians are cared for by one nurse. The Onondaga, St. Regis and Cattaraugus each have a public health nurse to demonstrate home nursing by giving bedside care to the sick; to teach hygiene in the home and schools; to give prenatal and maternal nursing care and instructions; to educate in child hygiene and prevention of tuberculosis and blindness; to assist the physicians in securing hospital and institutional care where necessary; to secure birth registration and assist in prevention and control of communicable disease. Much progress has

been made in this work by the nurses who went on duty in August of this year and their work is received with grateful appreciation and unusual eagerness of the mothers who thus learn how to care for the sick and how to keep the babies well.

Reorganization of the nursing staff of this Division has resulted in the assignment of nine supervising nurses to districts corresponding to that of the Sanitary Supervisors. Their duties are to assist communities to organize public health nursing service, to advise with organizations and individual nurses already in the field as to the development and standardization of their work, to organize child hygiene and tuberculosis clinics, to instruct and educate in hygiene and preventive measures, to assist the Sanitary Supervisor and Health Officer in the prevention and control of communicable disease, and to coordinate the activities of all public health nurses in her district and secure their cooperation when necessary.

The work of seven supervising nurses, each specializing with a division, shows a continued increase in development.

In *Child Hygiene* the supervising nurse held 294 conferences and interviews with health officers, physicians, public health nurses and lay persons. In reference to this work 99 child welfare clinics were organized and conducted with the Healthmobile and five without, details of which are given in the "Report of the Division of Child Hygiene." Eleven demonstrations in child welfare were given at county fairs and otherwise, talks and addresses were given in connection with the work.

The supervising nurse of *Midwives and Day Nurseries* inspected 31 day nurseries; visited and instructed midwives throughout the State; held 49 conferences and gave instruction to nurses; investigated birth registrations (detailed report is given by the Division of Child Hygiene).

The supervising nurse assigned to the *Division of Tuberculosis* supervised the work of the county tuberculosis nurses (there are now 52 county nurses in the State), and public health nurses doing tuberculosis work. She also assisted in conducting 18 county tuberculosis surveys and 60 tuberculosis clinics were held in 50 localities of the State and visited patients and contacts in 219 localities. Conferences and interviews with health officers, physicians, registrars, American Red Cross representatives and lay persons were held in 241 localities. Group consultation clinic nursing service was organized for six counties. Assistance and advice was given to 42 nurses in the development of their work and in record keeping. Fifteen tuberculosis hospitals and dispensaries were visited. Many talks and addresses were also given.

The supervising nurse with the *Division of Venereal Diseases* attended 163 clinics; visited 12 hospitals and institutions; inspected 11 clinic rooms and instructed nurses, and held 45 conferences and interviews with health officers, physicians and nurses.

The supervising nurse for the *Division of Communicable Diseases* assisted Sanitary Supervisors and Health Officers in investigation in typhoid fever. scarlet fever, influenza and diphtheria outbreaks in three counties and 46 municipalities. She also assisted in the examination of school children for communicable diseases where no school nurse was employed and in many of the tuberculosis surveys and clinics conducted. Demonstrations have also been made in order to assist communities in securing public health nurses.

One supervising nurse is assigned to the *Division of Public Health Education* to assist in editing the department's publications.

A second supervising nurse has been working in cooperation with farm bureaus for the purpose of instructing members in rural communities in elementary principles of home nursing and the necessity for public health nurses in such localities, has given 175 addresses and has reached a total of 12,865 people. As a result of her work classes in hygiene and home nursing have been organized and instruction given. Assistance and instruction to local public health nurses and to boards of health and other organizations in securing public health nurses has also been given.

A more detailed report of the activities of the supervising nurses is included in reports of the different divisions.

DIVISION OF VENEREAL DISEASES

During the year 1920 the Division of Venereal Diseases extended the scope of its work along the lines laid down in 1919. The education of the public was continued by means of lectures, exhibits and specially prepared literature; these educational activities were directed so as to include groups of society not reached during the war and to cover more intensely the larger groups where work was already started.

In January all boys' and girls' organizations in the State were invited to send delegates to a two days' conference at Albany for the purpose of devising methods of cooperation in conducting educational campaigns among the young people. The Military Training Commission was represented in these conferences and a working plan was devised which is now functioning. Rural groups in greater number requested our services during the year. A total of 17 counties was covered with the assistance and cooperation of the Home Bureau agents. In a number of the counties it was necessary to repeat our work because of urgent requests. Lecturers from the Division have assisted in the training courses for public health nurses, also in several of the health officers' courses. In the latter, demonstrations of treatment were given as well as lectures. A number of organizations, such as the Federation of Labor, Druggists' Associations, Rotary Clubs, and Chambers of Commerce have requested assistance in special public health programs. The Director was invited to be chairman of a division of the educational institute held in Washington, D. C., for training workers for all sections of the United States.

Special efforts have been made to aid the physician to keep in touch with the rapid advances made in the diagnosis and treatment of syphilis and gonorrhea. A series of records of difficult cases of these diseases were reprinted from the records of the Massachusetts General Hospital and distributed among 2,600 physicians of the State. A member of the staff called upon the druggists of the State and discussed with them the assistance they can render in preventing self-treatment.

Nine new venereal disease clinics were opened during the year, bringing the total up to 43 in the State, exclusive of New York City. Private physicians are cooperating whole-heartedly by submitting to the laboratory many more specimens for examination and by referring indigents to the clinics for treatment. During 1919 there were about 9,000 cases of syphilis and 2,400 cases of gonorrhea reported, while the 1920 record is as follows:

	Male	Female	Total
Syphilis			
New cases	6,180	3,260	
Old cases	1,643	945	
	7,823	4,205	
			12,028
Gonorrhea			
New cases	2,620	732	
Old cases	262	130	
	2,882	862	
			3,744
			15,772

At the clinics there were given:

Between Dec. 1, 1918, and Nov. 30, 1919 .... 35,864 treatments
Between Dec. 1, 1919, and Nov. 30, 1920 .... 74,573 treatments
showing an increase of more than 100 per cent.

The total number of new cases admitted to clinics between December 1, 1919, and November 30, 1920:

	Male	Female	Total
Syphilis	1, 540	853	2, 392
Gonorrhea	1, 757	214	1, 971
			4, 363

Total number of patients under treatment on Dec. 1, 1919........1,495
Total number of patients under treatment on Dec. 1, 1920........2,208
showing an increase of 47 per cent.

The distribution of arsphenamine has grown also. All State institutions as well as the clinics are receiving the drug as it is needed. During the year more than 10,000 grams, an equivalent of about 30,000 doses, were supplied.

The Division has been cooperating very closely since its organization with the State reformatories and penal institutions and during the past year an offer was made to extend its activities to all institutions whether public or private. Thirty-nine institutions accepted the offer, including 32 orphanages, six tuberculosis hospitals and one State hospital. A physician and nurse were detailed to make physical examinations of and take blood specimens from their inmates. A total of 10,400 persons (mostly children) were examined and 143 frank cases of syphilis discovered, while 150 other persons were gravely suspicious and need further study. Of the total number, 10,400, only 6,912 were frankly negative, while more than 3,000 were either positive or suspicious, and social workers are at present investigating the families of these cases with a view to securing treatment for any of their members who may stand in need of it. Treatment of the frank cases was started immediately.

The clinic directors are appreciating the wisdom of keeping in close touch with their patients during the course of treatment in order that they may not grow discouraged and discontinue their visits to the clinic. The nurses and social workers are rendering valuable assistance by their efforts. This medical follow-up work is growing to be very valuable and will prove to be even more so as it is developed. One of the State hospitals is being aided in investigating the families from which certain of their patients came. Many new cases of syphilis were discovered in these families and an extension of this work is imperative.

The change in the mental attitude of the public from war to peace time has had some effect upon the work of this Division but the reaction has not been as keenly felt as was expected. The average public audience is still actively interested in the control of venereal diseases but is anxious to relate it to a general health program or to a scheme for complete personal hygiene. The educational work of the Division is being modified to meet this demand. The number seeking medical care is increasing and can be expected to grow in the next year if the labor troubles which are now threatening materialize. Many persons are now taking treatment from private physicians who may be obliged to seek the public clinic because of financial straits. The Division is preparing itself for this emergency. The work started with the institutions should be continued, especially that which is under way with the orphanages.

DIVISION OF PUBLIC HEALTH EDUCATION

Public sentiment is the one dynamic force of sufficient power to insure necessary compliance with health rules and regulations. Without it, health authorities can not hope to secure adequate health law enforcement; with it, any law, no matter how drastic, can be effectively enforced for the benefit of the life and health of the many, even though it be to the detriment of the few.

Recognizing these facts, the State Department of Health, though possessing and occasionally being obliged to use mandatory powers, relies largely for the accomplishment of its aims, not upon edicts and prosecution, but upon that voluntary cooperation which develops as a result of a general comprehension of the need for public health regulations.

Such an understanding on the part of the public can only be obtained through a broad program of public health education thoughtfully conceived and efficiently carried out by the utilization of every legitimate means for bringing the facts convincingly to the people.

The methods employed in impressing health facts on the public vary according to conditions and the exact end sought. Pamphlets, periodical literature, moving picture films, lantern slides, and lectures, each has its place in the instruction of the public in how to protect itself from disease.

Monthly Publications

Health News. During 1920 symposiums have been presented in this publication on cancer, tuberculosis clinics, industrial health conservation, public health education methods and facilities, dispensaries and clinics, rural health campaigns, and public health nursing. A history of typical waterborne typhoid outbreaks was also compiled. In addition two general numbers were issued, one of which contained a review of the important health activities of the department during 1919. Each number has been prepared with the definite aim of making it of especial value to some particular group of health workers as well as a means of spreading general information to the public.

Public Health Nurses' Bulletin. In the autumn of 1919 when the number of public health nurses in the State reached 1,000, the need was felt for some method of keeping these workers informed of new methods, new ideas, and new regulations pertaining to their branch of work and of disseminating information regarding what was being accomplished in their profession throughout the State. Since a monthly bulletin seemed to be the best way of accomplishing this end the Public Health Nurses' Bulletin made its first appearance in January, 1920. Judging from the demand for copies and the commendation received from prominent public health officials it has served its purpose effectively.

Health Officers' Bulletin. This publication, as heretofore, has been restricted solely to the dissemination of official and semi-official information to health officers, and their assistants.

Health Literature

New health circulars or pamphlets published during 1920 include a monograph on encephalitis lethargica by Simon Flexner, M. D., Director of the Rockefeller Institute. "Teaching Health in the Schools" by L. Emmett Holt, M. D., revision of the circular on Vaccination, and the publication of a Public Health Nurses' Manual.

Three new circulars were edited and issued and a number of the present ones revised or reprinted. During the year approximately 60,000 health circulars and pamphlets were sent to persons requesting them, 108,000 baby books were mailed to mothers and a large number of pamphlets on Prenatal Care to prospective mothers.

News Letters

Since the newspapers are a very valuable agency in reaching the public quickly and effectively, not only in emergencies such as epidemics but for conveying health information of general value such as methods for prevention of acute respiratory diseases, clean-up week notices and the like, they have been utilized for the publication of news letters from time to time during the year as occasion offered.

Clean-up Campaign

Plans and suggestions for organized community clean-up work were outlined to health officers during the late winter and early spring. Especial emphasis was laid on the necessity for the removal of filth accumulated during the severe winter. The suggested methods and work appear to have been adopted very generally throughout the State.

Rural Health Campaign (Healthmobile)

The rural health campaign, first organized in 1919, when the healthmobile was put into commission, was reorganized in the spring of 1920 as soon as the roads opened and combined with child health clinics conducted by the Division of Child Hygiene, all the detail of scheduling, advertising and arranging for these meetings devolving upon this Division. The advance work for these clinics required practically the entire time and the details involved in securing halls for clinics, meetings and picture shows and the transporting of equipment were handled most efficiently by the healthmobile crew. In general, the itinerary was laid out so as to reach those sections of the State away from traction or steam railroad lines. The necessity for the campaign is shown by the higher morbidity and mortality rates in rural districts as compared with the cities. Results indicate that this campaign has been of very great value. Clinics, films, lantern slides, lectures and health drills have served to arouse interest for better living conditions, the abolition of health menaces, and the appreciation of the necessity for having defects corrected. From every county served by these clinics come reports of local organization to prevent sickness.

Films

In the exhibit work an increasing emphasis has been placed on the use of motion pictures, for experience has shown that this method of visual instruction is not only most effective in the work of public health education but that, from the business standpoint, it is most efficient, reaching the largest number of persons in the smallest time and at the least expense. This is especially true in the rural communities where the difficulties attending the use of models, panels and other bulky exhibits are almost insuperable but where, thanks to the healthmobile, motion pictures may be easily and economically shown before large audiences with most satisfactory results.

A number of new motion picture films has been purchased to meet the frequent demands. When these films are not in active service for a day or two for the use of the Department or local health agencies, they are loaned to commercial theatres which are always glad to include them in their regular program. Not infrequently it is found that such showings lead to such valuable results as requests for further information or an extension of health educational work.

Lantern Slides

Lantern slides as usual are in constant demand. During the past year the department's collection has been revised and much new material added. Outlines of lectures have been prepared to accompany sets of slides called Tuberculosis, Child Welfare, The Fly, and Clean-up Week. These have proved of great value to the smaller health agencies of the State and are in such constant demand that it is planned, as fast as possible, to make new material of this character available.

Another important rural activity has been the conducting of lecture courses on the home care of the sick, with special reference to the preventive work of the public health nurse. These meetings have been arranged by the Home Demonstration Agents throughout the State but the general planning of the campaign and the scheduling of meetings has been handled by this Division, one nurse devoting her entire time to this important phase of rural work.

As heretofore, this Division has endeavored to cooperate with local health agencies, notably the Farm and Home Bureaus, County Tuberculosis Committees and similar organizations and has assisted them in making up programs, in securing speakers for their meetings and in obtaining exhibit material.

Health Work in Parochial Schools

This work, which has been carried on by a member of the Division staff, has included the enforcement of the department's regulations for admission to school, health talks to pupils and instruction to teachers on health regulations, the detection of early symptoms of communicable disease and procedures for the control of epidemics. Disease census cards have also been distributed and instruction given in their use. In addition, our representative has inspected every parochial school building visited by her and recommended changes where necessary. From many districts come reports of steady progress in provision for teaching good health practices to children in the parochial schools.

Physicians for Rural Communities

Requests from communities for aid in securing physicians where medical service is inadequate or lacking have continued to come to us during the year. Since the work was first started, 82 requests have been received and 34 communities have been supplied through the efforts of this Division.

DIVISION OF SANITARY ENGINEERING

The work of the Engineering Division for 1920 reflects in a general way the same characteristics that have been apparent in nearly every professional and industrial field, namely, an unusual activity in almost every line of work and under trying conditions of professional employment. This situation is, of course, a direct outcome of war conditions and until sanitary engineers with training and experience essential to the work of the Engineering Division can be more readily obtained within the appropriations granted by the Legislature, or until present unusual demands upon our resources resulting from inactivity during the war has been reduced to normal, there will undoubtedly be little relief from these difficulties.

The activities of the Engineering Division, briefly stated, include the examination and approval of plans for sewerage systems and sewage disposal works; supervision of the sanitary quality of the public water supplies of the State; the investigation of major public nuisances generally, and specifically when called upon under order from the Governor; the examination and reports of the sanitary conditions of state institutions; the supervision of construction and operation of milk pasteurizing plants; the examination and approval of plans and budgets for Nassau County Mosquito Extermination Commission; advice to and approval of plans for water supplies and sewage disposal systems of County Tuberculosis Hospitals; the investigation of waterborne outbreaks of typhoid fever; consulting advice to municipalities, corporations and individuals in regard to all phases of sanitary engineering work; and educational and research work so far as these were possible within limited resources.

The work of the Engineering Division for 1920 may perhaps be most clearly and briefly presented in the following list which includes numerically the work performed by the Division according to its more important subdivisions and also includes for purposes of comparison the figures for the year 1919.

Volume of Routine Work

	1919	1920
Letters and other correspondence referred to Division....	2,666	3,020
Letters and reports sent out....	4,323	4,444
Plans examined and reported upon....	125	127
Investigations of public water supplies....	154	193
Investigations of sanitary conditions of State Institutions....	14	30
Investigations of sewage disposal plants....	17	16
Investigations relating to sewerage system....	10	13
Investigation of milk pasteurizing plants....	403	166
Investigations of stream pollution and nuisances....	47	68
Conferences held with local officials....	328	357
Lectures and addresses by staff....	6	7

Among those features of the work of the Division during 1920 which may be considered as of more than usual interest or importance may be mentioned, first, the special investigation of the sanitary conditions of certain public gathering places in the State, more particularly the 50 camps in the Palisades Interstate Park reservation in which some 75,000 boys and girls congregate during the summer months, and the some 80 county and other fairgrounds in the State where more than 1,500,000 persons congregate during the fair season. The questions of pure water supplies and sanitary methods of garbage and sewage disposal at these camps and fair grounds are obviously matters of fundamental importance, and the investigations and reports have been directed toward determining wherein and to what extent these various features are defective or insanitary and have concluded with certain definite recommendations that should be followed in order that these camps and fair grounds may be placed in proper sanitary condition.

Another feature of importance in the work of the Division has been the special investigation and consulting advice to the Department of the State Engineer and Surveyor and the Department of Architecture in connection with new or increased water supplies and sewage disposal systems for new state institutions or extensions of existing institutions. These relate to the new state hospital for the insane at Marcy, the new Wingate Prison and extension to the state hospitals at Beacon, Gowanda, Rome and Raybrook.

Other investigations having a very important bearing upon the public health of the State include a special investigation and action by the Department in the protection of public water supplies of the State against contamination by impure auxiliary or industrial fire supplies, in connection with which a number of typhoid fever outbreaks have occurred during the past few years; and a special investigation and epidemiological studies in connection with certain outbreaks of waterborne diseases other than typhoid fever, a number of which have also occurred in the State during the past few years.

In the field of research work and advancement of engineering knowledge generally may be mentioned practical experiments in the purification of oysters; development of new types and designs in screens and tanks for the purification of sewage; practical experiments in the sedimentation of sewage at Syracuse in connection with its problem of sewage disposal; and practical experiments and full sized installations of apparatus and methods for deodorizing and eliminating objectionable waste gases and odors from certain industrial establishments at Edgewater, N. J., which has been the source of serious nuisance to a large residential section of New York City.

DIVISION OF CHILD HYGIENE

In accordance with the plans for extension and intensification adopted at the beginning of the year, the activities of the Division of Child Hygiene during 1920 comprised: 1. Education of the general public and of special groups in maternal, infant and early childhood mortality and morbidity problems and their solution. 2. Stimulation of local agencies to provide for adequate and effective instruction and supervision (including periodic examinations and care) of mothers, prospective and actual, and the care of their unborn children, infants and preschool children. 3. Initiation and demonstration of measures to secure the proper organization, establishment, maintenance, extension, standardization and coordination of the necessary agencies and the rendering to them of all possible assistance and cooperation. The very gratifying results in more adequate and effective protection of their lives and health have exceeded expectations.

The fields requiring special efforts included the maternity and prenatal and preschool period which have received a very large share of attention with the result that activities concerned with these phases of the work are now well under way throughout the State, as are more comprehensive efforts in the field of infancy.

As the result of a complete and exhaustive survey of all the local child hygiene stations of which the Division had any records, it was found that, including a number newly established, there are now 67 municipalities provided with 125 stations which are in actual and effective operation. These have been visited by the nurses and physicians of the Division, assistance given in improving the work undertaken and special efforts made to extend the scope and field of their activities. Of these stations, almost all of which had previously confined their activities to the period of infancy, most have now actually entered upon work with prospective mothers and with children of the preschool period and the remainder have made plans to do so. Complete reports are now received quarterly from these stations.

Almost all of the more than 1,000 local public health nurses were engaged in child hygiene activities, in the case of the majority of these, such activities constituting one of their major and for very many, their exclusive duties. A large number of new nurses were appointed locally during the year. These were visited and assistance rendered them in beginning their work and further aid in continuing their activities given to them and to the other nurses who were also visited. The plan of having birth certificates delivered by local public health nurses was instituted with excellent results. The Division took part in a series of lectures introductive to public health work given to student nurses in several of the hospitals of the State as it did also in the preparation of a plan for giving complete courses of instruction to public health nurses analogous to those now provided for health officers.

A very large number of new Little Mothers' Leagues were established, and thousands of members were graduated. These leagues were introduced into very many of the schools.

The licensing and supervision of midwives was assumed by this Division the first of the year and efforts continued and extended to eliminate unfit and unworthy practitioners and to improve the work of those who were licensed. During the year 458 midwives located in 119 municipalities were licensed; five were refused a renewal, three were found ineligible on account of health and licenses for seven were held up temporarily. One midwife had her license revoked, one resigned to avoid revocation of license, three died, ten retired and 14 left the department's jurisdiction. Three hearings were held in the cases of two midwives. Arrangements were made for more effective local supervision of midwives and instruction was given to nurses in 45 localities. Special efforts were made to check birth registration and to increase eye prophylaxis and numerous cases of irregularities in these and other respects were investigated and acted upon.

Special departmental rules and regulations relating to day nurseries were

promulgated and the supervision of these institutions was undertaken. Thirty-three were inspected and the necessary recommendations for correction of the defects found were brought to the attention of those responsible with very satisfactory results.

Limited supervision of children's boarding homes was also begun and a number of complaints investigated and acted upon.

Special efforts were made to improve the character of the milk supplied to children of the State; one municipality adopted a pasteurization ordinance and another provided for a municipal pasteurizing plant by popular vote.

Health study clubs were organized in eight counties and a total of 155 lectures on the hygiene of the various periods of life (prenatal, infancy, preschool, school, adolescence and adult) were given in 61 localities to a total of about 7,146 persons. In addition to these, about 200 addresses and lectures on various phases of child hygiene were given, a large number of exhibits were shown and many better baby and baby improvement contests were held in all parts of the State. Numerous conferences, national, state and local, were attended by members of the Division staff and many papers were read.

Six new pamphlets dealing with maternity and prenatal care, the preschool period, child welfare activities, the feeding of children and their growth and development were prepared; three were issued and the other three will soon be ready. About a quarter of a million pieces of literature were most usefully distributed.

The department is represented on the commission to study the laws relating to child welfare appointed pursuant to an act of the 1920 Legislature.

The most outstanding piece of work undertaken and one which gives every indication of being productive of perhaps more definite accomplishments than any other single line of endeavor, is the conduct of children's health consultations in the rural sections of the State. With the assistance of local health officers and practitioners 2,714 children, including infants, and those of preschool and school age, have been examined thus far in 99 municipalities located in six counties in as many sanitary districts. These examinations, intended to discover existing disease, defect or disability, have resulted in finding 2,082 children (76.71 per cent.) with defects. Of this number, 1,438 (68.9 per cent.) had conditions requiring further medical observation and care, and the remaining 629 (30.2 per cent.) needed correction in feeding and hygiene. In addition, through the stimulation and with the assistance of this Division, such consultations were held in a number of municipalities by local agencies. All children requiring medical care are referred for such services to their own physicians. Adequate follow-up work has already been instituted in many of the localities and a large number of the children have had their defects satisfactorily treated. The importance and value of these clinics lie in the specific personal appeal made by the discovery of existing disease, the demonstration of the need for periodic examinations, proper hygiene and correction of defects, and for the provision of sufficient public health nurses and other agencies to carry on this work locally. The demand for this service has become very great; it is impossible to meet it. It is planned, however, to go into all sections of the State. Beginning on January 3, 1921, such consultations will be conducted in some of the larger villages of seven sanitary districts, such work to be continued until weather conditions permit again entering the more strictly rural sections.

Poliomyelitis after-care

During the year ending December 31, 1920, 78 clinics for the after-care poliomyelitis cases were held in 48 municipalities. The total attendance at these clinics was 1,043 and of this number 284 attended the clinic for the first time and 759 had attended one or more previous clinics.

Of the total number 146 were suffering from some orthopedic defect which was not caused by poliomyelitis but came to one of the clinics for advice.

Of the total number of poliomyelitis, namely, 759, 52 were discharged as practically normal and needing no more treatment or observation by the

visiting nurses; 585 were improved to a greater or less degree, and 132 were found to be in about the same condition as at one of the previous clinics. A few who had received advice at one of the earlier clinics, which advice had not been followed by the parents, were brought to the clinic this year, and were found to be decidedly worse; some of them requiring operations for the correction of deformities.

The patients under state care reside in 382 different municipalities which have to be visited by the staff of nurses, and it is due largely to the faithful work of these nurses in visiting the patients, sometimes under great difficulties, that the interest of both parents and patients has been retained for so many years and that the majority of the cases show such decided improvement.

In July a Reconstruction Home was opened in Ithaca, N. Y., for the care and treatment of badly paralyzed cases or those who on account of their physical disability were unable to obtain education in the local schools. The Home is managed by a Board of Managers consisting of prominent citizens of Ithaca, Elmira, Cortland, Bath and Hornell and the Red Cross and other organizations are providing the maintenance for many of the children. From fifteen to twenty children have been regular inmates of the Home and their progress has been very rapid.

In addition to the regular clinics for the after-care poliomyelitis cases the orthopedic surgeon has been the consultant in the five group consultation clinics which have been held during the year. At these clinics 236 patients were seen, of which 69 were poliomyelitis cases, and the rest were referred for other orthopedic defects. As a result of these consultations a number of these latter patients were enabled to receive proper orthopedic care and treatment through the advice given to their attending physicians.

The number of orthopedic cases other than those resulting from paralysis which have attended the consultation clinics and also the regular clinics seem to show that there is a need for orthopedic consultation work in these parts of the state not readily accessible to the cities where orthopedic surgeons are located.

Fifty-two patients have been admitted to various hospitals for operations or corrective work by means of plaster of paris jackets, splints, etc. The results in these cases have been very satisfactory.

Two hundred and ninety-three pieces of apparatus consisting of corsets, braces, etc., have been ordered and sent to patients. These have been made at the Charitable Surgical Appliance Shop of the Children's Hospital, Boston, and the cost of the same met by the parents or various local organizations interested in the work.

The state clinics and the work of the district nurses during the past few years have proved to be of great value also to the practicing physicians of the State, and when the district nurses visit new cases at the request of the family physician they find, as a rule, proper instructions for the early care of these cases have been given to the parents. This is quite contrary to their experience in the beginning of the work.

DIVISION OF VITAL STATISTICS

During 1920 there were registered in the entire State of New York 233,016 births and 143,767 deaths,— these giving a birth rate* of 21.1 and a general death rate of 13.0, the latter being 12 per cent below the 1913-17 five-year average of 14.7. Among the important causes of death, those which show rates above the 1913-17 average are *influenza, 59.2; measles, 9.9; whooping cough, 9.1; cancer, 94.6,* and *automobile accidents, 12.6.* This death rate from automobile accidents is more than double that of the five years 1913-1917, 6.0. Among these causes of deaths which show a decrease in rate below the five-year average are *infantile paralysis, 0.6; lobar pneumonia, 80.7; bronchopneumonia, 67.8; typhoid fever, 3.3; cerebrospinal meningitis, 1.8; cerebral hemorrhage, 60.5; organic heart disease, 303.9; diarrhea and enteritis (under two years), 41.9; cirrhosis of the liver, 6.9; acute and chronic Bright's disease, 104.9; congenital malformations and debility, 63.9,* and *pulmonary tuberculosis, 99.1.* The infant mortality rate for 1920 is 86.9, a decline of more than 10 per cent from the five-year average.— which represents a decline in the State generally. The death rate of 99.1 from pulmonary tuberculosis is 30 per cent below the five-year average of 142.6 for 1913-1917.

In general, the observance of the Vital Statistics Law by physicians, midwives, and undertakers, and its enforcement by the local registrars, has been excellent, a condition clearly evident in the data which have been published monthly in the VITAL STATISTICS REVIEW. There are 1,487 districts which send births and death certificates to the State monthly; almost 100 per cent of these districts filed their returns before the end of each succeeding month, including the epidemic month of February during which traffic was hampered by storms and severe winter weather,— this splendid result is significant of the general efficiency and excellent morale of the local registrars as a group of public officials. A similarly fine record was achieved by the physicians, midwives and undertakers in the matter of promptness in filing their certificates with the local registrar; out of more than 100,000 birth certificates filed *less than one per cent* were apparently filed late, and out of more than 70,000 death certificates *less than one-half of one per cent* showed apparent failure on the part of undertakers to secure burial permits within 72 hours as required by law.

During the same year 22,707 birth and death certificate corrections were received and entered, including supplementary reports of given names for newborn children. About 5 per cent of the death certificates filed were subsequently corrected by undertakers, physicians or others; and about 4 per cent of the causes of deaths were subsequently corrected by physicians. The Division made 2,545 searches of the records; issued 819 certifications of special information, 888 certified copies of records, and collected $853.96 in fees.

The most important statistical work undertaken by the Division was the publication of the monthly VITAL STATISTICS REVIEW, the first number of which appeared in February. This Review contains in condensed form a monthly detailed statement of the statistics of births, sickness, and death in the State of New York and its cities and counties, including fatality rates from communicable diseases and the graphic exhibition of important facts. During the year the special study of statistics of epidemic influenza, marriage, infant mortality, and standardized death rates was continued. The studies of marriage, infant mortality, and standardized death rates have been nearly completed and will be ready for publication in 1921. Before the close of the year 1920, plans were prepared for a comprehensive statistical study of the causes of stillbirth, a work which will be carried on during the year 1921.

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* The birth and *general* death rates in this report are per 1,000 total estimated population. all other rates are per 100,000. All rates except infant mortality are provisional, being subject to correction when the latest United States census figures are available.

PUBLIC HEALTH COUNCIL

PUBLIC HEALTH COUNCIL

HIS EXCELLENCY, NATHAN L. MILLER, *Governor of the State of New York, Albany, N. Y.:*

SIR.— The Public Health Council has the honor to submit the seventh annual report covering its work for the year 1920.

Safeguarding the Health of Rural and Industrial Communities

In the last annual report of the Council it was stated that in general throughout the State in smaller cities, in rural districts and industrial centers, the health of the people was not adequately safeguarded. It was then the opinion of the Council that this condition arose partly from the scarcity of physicians, but largely from an inadequate number of public health nurses, local clinics and the dearth of hospital facilities.

The Council has continued its study of the situation. It has made a survey of the conditions existing in the State in regard to the practice of medicine. It has found that in several counties with large rural populations the number of physicians is diminishing. And as younger men do not find such conditions as exist attractive, the older generation of physicians — those in practice more than twenty-five years now predominating — is not being replaced, as was formerly the case, by men bearing the knowledge, the outlook and the inspiration of the new day in medicine.

During the past two years appeals for help in securing physicians have been received by the State Department of Health from 82 communities — located in 37 counties — and it could help less than half of them.

Last year the Council recommended the establishment throughout the State of health centers to be aided by grants from the State; and under the supervision of the Council a bill permitting such establishment and granting such aid was drawn and introduced in the Legislature. It, however, failed of passage. The Council since the adjournment of the Legislature has been engaged in perfecting the bill of last year and respectfully recommends that a bill similar in principle to the one introduced last year be enacted by the Legislature.

The convictions which impel the Council to continue its urgency of this public health measure are based upon a few simple facts. There has come to the world within the past few years a great enlightenment as to the nature and incitants of disease and particularly of those most common and serious maladies called infectious, which are often communicable and now and then devastate the earth in great pestilences. With this knowledge science has taught the world how the body strives to protect itself against these germ diseases and how physicians can help it. Through the development of laboratories it has become possible to detect incipient ailments of various sorts, to aid the physicians in distinguishing between one disease and another, to furnish him with effective remedies and to gauge and control the progress of cure.

So rapid has been this advance in knowledge that many forms and phases of health service have already crystalized as specialties. Such are the control of communicable diseases, sanitary supervision, laboratories, child welfare, tuberculosis, the venereal infections, educational service, statistical records, and public health nursing. These agencies are woven into the enlightened public health organizations of to-day. Through these and other public and private activities the death rate in civilized communities has been reduced, the chance of prolonged life, of health, of efficiency and enjoyment have greatly improved for those who can secure, when they need them, these beneficient ministrations.

Almost as soon as it was discovered — now some half a century ago — that the incitants of infectious diseases are minute living organisms, and as one by one of the particular incitants of each were found out, the prevention as well as the rational treatment of these diseases became possible. But from the beginning until to-day the actual benefits in prevention and treatment, great as they are, have fallen far short of the possibilities. This

has been largely through failure of physicians, public health authorities and the people themselves, to use the knowledge which science has so diligently gathered and so freely laid at the service of mankind. So that while diphtheria, typhoid fever, tuberculosis, and many others of this sinister brood of human maladies are distinctly and in many cases readily preventable, they continue to scourge humanity.

The State of New York was earliest in the field with an adequate health law. The citizens of the State owe a tribute of cordial appreciation to successive Governors and Legislatures for their sagacity and sustained regard for the general welfare, in the enactment of this law and in its continual adaptation to the growth of science and experience in public health administration. Under this law a State Department of Health has been organized and conducted, so comprehensive in its scope, so inspiring in its leadership, so alert and effective in bringing the contributions of science and experience at once to the service of the citizens of the State, and so fortunate in its enlistment in the cause of the public welfare, of officials of conspicuous capacity and devotion, that it has been the model as it is the envy of many another commonwealth.

But there are large numbers of citizens of the State, chiefly in rural and industrial communities, who under existing conditions are not able to avail themselves of these ministrations of health, which at large cost in money and service are freely offered to them. Whether they get this service or not means life or death, health or illness, well-being or misery, efficiency or loss, the enjoyment or the endurance of life to many thousands in the State each year who deserve well at its hands.

The new ideals of health which the more enlightened of the world's folk cherish, to-day, are more comprehensive than the mere absence of obvious disease. They look to the maintenance of such conditions of life for all and such general enlightenment that the enjoyment of vigorous health shall be the heritage of the majority of those who may choose to have it. But these must be assisted in the more difficult and costly service which science has so successfully developed, they must be enlightened as to their part in the accomplishment of these aims, and all citizens should share alike in the helpful service which the State affords.

The Council cherishes the hope that it may soon become possible for such communities as may elect to do so, to provide local clinics and hospitals where these are required, which shall bring them into helpful relationship with such experienced consultants in illness as they may select; shall offer local physicians facilities for institutional treatment for their patients who need it, more nearly comparable with those now increasingly sought and found by poor and rich alike in the cities and larger communities. The Council believes that such concentration of forces as the modern health center affords would make more freely available the great resources of the laboratories of the Department of Health of the State, now held in high esteem the world over, and which are so closely bound up with the outcome of many a critical hour and medical decision, in the stories of individual illness throughout the State.

Almost more than in any other feature of this new project does the interest and the expectation of the Council center in the wider employment of the public health nurse, especially in rural and industrial communities, where, in the relief of suffering, in the comfort and encouragement which her presence brings, and in the educational value of her personal counsel in the ways of wholesome and healthful living, lies a promise of practical benefit not easily over-estimated.

This is not the place to discuss the details of legislation which the Council has suggested, but one other phase of the matter may be touched upon. Millions of dollars are lost in the State of New York each year through working days wasted in the miseries of readily preventable disease. Death on every hand claims its grim tribute to ignorance and neglect of the principles and practice of intelligent cleanliness. The economic losses incident to quite unnecessary disabling illness among industrial workers alone in the State are almost incredible.

The keynote to the proposed measures, as to a large part of the concern of the Council in the promotion of the public health, is the *prevention* of disease. By these measures the welfare of the sick, all of the sick, is to be promoted by all the means which science and experience have made available for more favorably located or circumstanced citizens. But beyond this, the outstanding tender of this proposal is to carry far and wide the teaching, the counsel, the practical exemplary service which shall emphasize the importance of measures of prevention so largely in command of the citizen himself. For most public health measures for the prevention of disease are futile without the intelligent, wholehearted, persistent cooperation of the public whose interests are so deeply at stake. It is this cooperation in rural and industrial communities which these measures have been framed to enlist, as well as to provide for a directly beneficial personal service.

Leaving aside for the moment the advantage which would certainly accrue from the proposed undertakings in rural communities, for which calculations are not readily made, we recall here a former estimate made by the Council in considering certain health measures relating to the industrial workers of the State and now partially covered in the activities of the proposed health centers. Estimates show that the country over among industrial workers, the average loss from disabling sickness is at least eight days for each worker per year. This applies exactly to the State of New York. On the basis of eight lost working days per year for each industrial worker some 10,000,000 working days each year are lost through illness to the industries of the State of New York. If one assumes that only the very modest proportion of one-tenth of this loss in production and efficiency would be saved through the services associated with the proposed health centers, 1,000,000 rescued days at, say $3 per day would seem an annual amount worth saving in this day of economic stresses; to say nothing of the spared cost of medical and other expensive service, of preventable suffering and misery, of prolonged and rescued life, of the heightened efficiency of workers resulting from better average health, and of the increased vitality and contentment which improved conditions of life inevitably foster.

Health Districts

In the Health Center Bill, which was recommended by the Council at the 1920 session of the Legislature, was a provision for the optional establishment of counties as separate health units. These provisions had no direct connection with the health center portions of said bill. The Council therefore deems it wise to separate into two bills the bill of last year. The Council believes that with the consolidation of small districts into larger units, with adequately paid health officers in charge thereof, the administration of the Public Health Law and the Sanitary Code throughout the State will be greatly improved and therefore recommends that Legislation be enacted authorizing the establishment of counties or any parts thereof as separate health units.

Municipal Salaries for Physicians

As a measure of temporary relief from the scarcity of physicians and pending the enactment and establishment of the health center system, the Council last year recommended to the Legislature that a law be enacted allowing municipalities to pay a salary to a physician in order to induce him to reside in said municipality, and allowing two or more municipalities to combine in such employment. This bill became a law and in several instances its provisions have been taken advantage of.

Incorrigible Tuberculosis Patients

The Council also considered during the year the question of handling incorrigible tuberculosis patients and appointed a committee to investigate the subject, make a survey of conditions, and report to the Council. The committee has done this and the report is now under consideration of the Council.

Amendments to the Sanitary Code

In order to meet the practical requirements which new knowledge and experience each year involve, the Council found it necessary in 1920 as usual to revise in various ways the Sanitary Code of the State. It is only by this constant adaptation of the Code to the advancement of science and by the incorporation of the lessons of experience that the important office of the code is fulfilled with the greatest efficiency and the least practicable inconvenience to the various interests of the citizens.

The revision of the Code required the reporting of encephalitis lethargica, the so-called "sleeping sickness," a communicable disease which has recently appeared in this country, and demanding immediate measures for the protection of the community; also the reporting of botulism, a form of food poisoning of occasional serious import and requiring constant attention. Another revision of the Code extended the prohibition against the use of the common towel to the schools of the State, a measure of obvious importance. Still another amendment entirely revised the procedure laid down in the Code of Civil Procedure in relation to suppression of nuisances, in order that a more workable and scientific method should be provided.

It was further required that all pasteurization of milk in the State should be under such sanitary provisions as might be prescribed by the State Commissioner of Health, so that certain sources of danger incident to the old procedure might be avoided. The Council also changed the time for the annual inspection of dairies, so that inspection might be made during a more convenient open season. It also eliminated the provision of Regulation 2 of Chapter III that application for permit to deal in milk should be verified, thereby simplifying the procedure. It forbade the removal of any person affected with a communicable disease from one health district to another without the consent of both health officers involved.

In addition to this, the Council amended the Code as to certain details in the case of quarantine; as to the qualifications of midwives; procedure on the revocation of licenses of midwives; and as to the language in which the circulars of instruction in the case of communicable diseases might be printed.

Attached hereto and marked appendix "A" is a copy of all of the amendments to the Sanitary Code adopted by the Council during the year 1920.

The Model Sanitary Code

Each community in the State of New York has the right to set its own pace in sanitary practices, provided it does not conflict with the Sanitary Code of the State. Consequently, since communities and their health officers vary largely in intelligence, knowledge and public spirit, there have been in the past nearly as many sanitary codes in the State as there were community units.

Some years ago the State Department of Health issued a "Model Sanitary Code," suggesting that its adoption would greatly contribute to the general welfare. Out of some 1,400 communities at that time professing and practicing sanitation according to their local light and inspiration, 763 have now voluntarily adopted the Model Code, and are seeking sanitary salvation in the light of science and the general experience.

Qualifications for Health Officers and Midwives

The number of health officers who are taking or have taken one of the qualifying courses for health officers established under the auspices of the State Department of Health has largely increased during the last year, and the time appears not distant when practically all of the health officers of the State will have complied with the qualifications established by the Council. The growing scarcity of rural physicians is reflected again this year in the large number of applications coming before the Council for exemption from qualifications established for health officers and the Council was in not a few instances compelled to grant exemptions because no other available physician resided in the dis-

trict concerned. During the year the Council had before it 321 applications from health officers for exemption from qualifications or for the acceptance of substitute qualifications, and two applications from midwives of the same nature.

Many minor matters were considered by the Council which are not deemed of sufficient importance to discuss at length.

All of which is respectfully submitted.

HERMANN M. BIGGS,
Chairman
MRS. ELMER BLAIR,
SIMON FLEXNER,
HOMER FOLKS,
HENRY R. OGDEN,
T. MITCHELL PRUDDEN,
JACOB GOLDBERG,
Members of Public Health Council

JOSEPH A. WARREN,
Secretary

APPENDIX I

AMENDMENTS TO THE SANITARY CODE *

CHAPTER II

Communicable Diseases

Regulation 13 of Chapter II of the Sanitary Code is hereby amended to read as follows:

Regulation 13. Removal of cases of communicable disease. After isolation by the local health officer no person, without permission from him, shall carry, remove, or cause or permit to be carried or removed from any room, building, or vessel any person affected with diphtheria, scarlet fever, smallpox or typhus fever.

Without permission from the local health officer no person shall carry, remove, or cause or permit to be carried or removed from or to any hotel, boarding house, lodging house, or other dwelling, any person affected with chickenpox, diphtheria, encephalitis lethargica, epidemic cerebrospinal meningitis, epidemic or septic sore throat, measles, mumps, poliomyelitis, acute anterior (infantile paralysis), scarlet fever, smallpox, typhus fever, or whooping cough.

Without permission from the local health officer no master of any vessel or other person shall remove or aid in removing, or permit the removal, from any such vessel to the shore of any person affected with any communicable disease.

This regulation shall not apply to any vessel within the jurisdiction of the health officer of the port of New York.

No person shall remove or permit to be removed from one health district into another, any person affected with communicable disease, except with the permission of the health officer from whose jurisdiction such person is to be removed and also of the health officer into whose jurisdiction such person is to be removed and in accordance with such rules and regulations as may be adopted by the state commissioner of health.

This regulation as amended took effect January 5, 1921.

Regulation 14 of Chapter II is hereby amended to read as follows:

Regulation 14. Removal of articles contaminated with infective material. Without instruction *and permission* from the health officer no person shall carry, remove or cause or permit to be carried or removed, from any room, building, or vessel, any article which has been subject to contamination with infective material through contact with any person or with the secretions of any person[s] affected with Asiatic cholera, diphtheria, *plague*, scarlet fever, smallpox or typhus fever, until such article has been disinfected according to the special rules and regulations of the state department of health.

Without permission of the local health officer no master of any vessel or other person shall remove or aid in removing or permit the removal from any such vessel to the shore of any article which has been subject to contamination with infective material through contact with any person or with secretions of any person affected with Asiatic cholera, diphtheria, *plague*, scarlet fever, smallpox, typhoid fever, or typhus fever.

This regulation shall not apply to any vessel within the jurisdiction of the health officer of the port of New York.

This regulation as amended took effect January 5, 1921.

Regulation 19 of Chapter II is hereby amended to read as follows:

Regulation 19. Distribution of circulars. It shall be the duty of every health officer, as soon as a case of diphtheria, encephalitis lethargica, epidemic cerebrospinal meningitis, epidemic or septic sore throat, measles, poliomy-

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* New matter *underscored*, deleted matter in brackets.

elitis, acute anterior (infantile paralysis), scarlet fever, smallpox, typhoid fever, typhus fever or whooping cough is reported to him, or as soon thereafter as possible, to give every family or individual living in the house or building, in which such case is, the circulars of information and copies of any rules and regulations, printed *when practicable* in a language understood by such individual, concerning such diseases which may be issued by the state department of health or the local health authorities. The health officer shall also notify every family or individual living in the house of the existence of such disease.

This regulation as amended took effect January 5, 1921.

Regulation 36 of Chapter II is hereby amended to read as follows:

Regulation 36. Minimum period of isolation. *For the purpose of this code,* the minimum period of isolation [within the meaning of this code, shall be] *is hereby declared to be* as follows:

Chickenpox, until twelve days after the appearance of the eruption and until the crusts have fallen and the scars are completely healed.

Diphtheria (membranous croup) until two successive [negative] cultures [have been obtained] *taken* from the nose and throat at intervals of not less than twenty-four hours, *have been examined and found negative in a laboratory approved for this purpose by the state commissioner of health.* The first of such cultures being taken not less than nine days from the day of the onset of the disease.

Epidemic cerebrospinal meningitis, until two weeks after the temperature has become normal or until three successive cultures, obtained from the nasopharynx at intervals of not less that five days, shall be found free of meningococci.

Measles, until at least five days after the appearance of the rash.

Mumps, until two weeks after the appearance of the disease and one week after the disappearance of the swelling.

Poliomyelitis, acute anterior (infantile paralysis), until three weeks from the day of the onset of the disease.

Scarlet fever, until thirty days after the development of the disease and until all discharges from the nose, ears and throat, or suppurating glands have ceased.

Smallpox, until fourteen days after the development of the disease and until scabs have all separated and the scars completely healed.

Typhoid or para-typhoid fever, if the patient's occupation involves the handling of milk, dairy products, or other food, until all signs of the disease, or all secondary or complicating infections incited by the agents of these diseases, have disappeared, and until two successive specimens of the intestinal discharges of the patient have been taken at an interval of not less than seven days and have been examined in a laboratory approved *for this purpose* by the state commissioner of health and found to be free from typhoid or para-typhoid bacilli.

Whooping cough, until eight weeks after the development of the disease or until one week after the last characteristic cough.

This regulation as amended took effect January 5, 1921.

CHAPTER III

Milk and Cream

Regulation 1 of Chapter III of the Sanitary Code is hereby amended to read as follows:

Regulation 1. Permit required for sale of milk in municipalities. No corporation, association, firm or individual shall sell or offer for sale at retail, milk or cream in any municipality without a permit from the health officer thereof, which shall be issued subject to such conditions as may be imposed by this code or by the local health officer, *except that the local health officer may exempt from the provisions of this regulation, persons selling*

milk from not more than one cow. Such permit shall expire on the *thirtieth* day of *April,* unless another date is designated by the local [authorities] health board, and shall be renewable on or before such date in each year, and may be revoked at any time for cause by the state commissioner of health or the local health officer after a hearing on due notice.
This regulation as amended took effect January 5, 1921.

Regulation 2 of Chapter III is hereby amended to read as follows:
Regulation 2. Application for permit required. No permit for the sale at retail of milk or cream in any municipality shall be issued unless written application [sworn to by the applicant], has been made therefor in the form prescribed by the state commissioner of health.
This regulation as amended took effect January 5, 1921.

Regulation 4 of Chapter III is hereby amended to read as follows:
Regulation 4. Dairy farms to be inspected and scored. [Previous to the first day of January, 1915, the] *Each* health officer or his representative [in every municipality] shall made a sanitary inspection *and scoring* of every dairy farm where milk or cream is produced for sale at retail [in such municipality and shall score each such dairy farm on the score card prescribed by the state commissioner of health.
On or after the first day of January, 1915, each such health officer or his representative shall make such inspection and scoring at least once in each year and before the thirty-first day of March in each year unless another date is designated by the local authorities pursuant to regulation 1 of this chapter] *within his district, at least once in every twelve months and between November first and April thirtieth unless another date is designated by the local board pursuant to regulation 1 of this chapter.*
The local health officer of such municipality may, however, in his discretion, accept the inspection and scoring by the health officer or his representative of another municipality.
This regulation as amended took effect January 5, 1921.

Regulation 12 of Chapter III, is hereby amended to read as follows:
Regulation 12. Pasteurization. Except where a different standard of pasteurization has been adopted previous to the first day of September, 1914, by the local health authorities, no milk or cream shall be sold or offered for sale as pasteurized unless it has been subjected to a temperature of 142 to 145 degrees Fahrenheit for not less than thirty minutes, *and under such sanitary conditions as may be prescribed by the State Commissioner of Health;* and no milk or cream which has been heated by any method shall be sold or offered for sale unless the heating conforms to the provisions of this regulation.
After pasteurization the milk or cream shall be immediately cooled and placed in clean containers and the containers shall be immediately sealed.
No milk or cream shall be pasteurized more than once.
This regulation as amended took effect January 5, 1921.

CHAPTER IV

Midwives

Regulation 9 of Chapter IV of the Sanitary Code, is hereby amended to read as follows:
Regulation 9. Revocation of license. The state commissioner of health *or his deputy* may revoke a license to practice midwifery, for cause, after having given the midwife an opportunity to be heard.
This regulation as amended took effect January 5, 1921.

CHAPTER II

Regulation 1. Communicable diseases designated. When used in the public health law and this code the terms infectious, contagious, or communicable disease shall be held to include the following diseases, which are hereby declared to be communicable through the conveyance of infective organisms. The communicable diseases for convenience of administration, are divided into two groups:

A. Anthrax
Botulism
Chickenpox
Cholera, Asiatic
Diphtheria (membranous croup)
Dysentery, amoebic and bacillary
Encephalitis lethargica
Epidemic cerebrospinal meningitis
Epidemic influenza
Epidemic or streptococcus (septic sore throat)
German measles
Glanders
Measles
Mumps
Para-typhoid fever
Plague
Pneumonia
  a. acute lobar
  b. bronchial or lobular
Poliomyelitis, acute anterior (infantile paralysis)
Puerperal septicaemia
Rabies
Scarlet fever
Smallpox
Tetanus
Trachoma
Tuberculosis
Typhoid fever
Typhus fever
Whooping cough

B. Syphilis
Gonorrhoea
Ophthalmia neonatorum (suppurative conjunctivitis of the newborn)
Chancroid.

Amended April 27, 1920, in effect June 1, 1920.
Amended May 27, 1920, in effect June 15, 1920.

Regulation 8. Reporting cases of communicable disease on dairy farms by physicians. When a case of Asiatic cholera, diphtheria, amoebic or bacillary dysentery, *encephalitis lethargica*, epidemic cerebrospinal meningitis, epidemic or septic sore throat, para-typhoid fever, poliomyelitis, acute anterior (infantile paralysis), scarlet fever, smallpox, or typhoid fever exists on any farm or dairy producing milk, cream, butter, or other dairy products for sale, it shall be the duty of the physician in attendance to report immediately to the local health officer the existence on such farm or dairy of such case.

It shall be the duty of the health officer to report immediately to the state commissioner of health, by telephone or telegram, the existence on such farm or dairy of such case, together with all facts as to the isolation of such case, and giving the names of the localities to which such dairy products are delivered.

Amended April 27, 1920, in effect June 1, 1920.

Regulation 12. Adults not to be quarantined in certain cases. When a person affected with a communicable disease *other than smallpox* is properly isolated on the premises, adult members of the family or household, who do

not come in contact with the patient or with his secretions or excretions, unless forbidden by the health officer, may continue their usual vocations, except *as provided in regulations thirty-seven and thirty-nine of this chapter and* provided *further that* such vocations do not bring them in close contact with children, nor require that they shall handle food or food products intended for sale.

Amended May 27, 1920, in effect June 15, 1920.

Regulation 13. Removal of cases of communicable disease. After isolation by the local health officer no person, without permission from him, shall carry, remove, or cause or permit to be carried or removed from any room, building, or vessel any person affected with diphtheria, scarlet fever, smallpox, or typhus fever.

Without permission from the local health officer no person shall carry, remove, or cause or permit to be carried or removed from or to any hotel, boarding house, lodging house, or other dwelling, any person affected with chickenpox, diphtheria, *encephalitis lethargica*, epidemic cerebrospinal meningitis, epidemic or septic sore throat, measles, mumps, poliomyelitis, acute anterior (infantile paralysis), scarlet fever, smallpox, typhus fever, or whooping cough.

Without permission from the local health officer no master of any vessel or other person shall remove or aid in removing, or permit the removal, from any such vessel to the shore of any person affected with communicable diseases.

This regulation shall not apply to any vessel within the jurisdiction of the health officer of the port of New York.

Amended April 27, 1920, in effect June 1, 1920.

Regulation 17. Instructions as to disinfection of discharges in diphtheria, encephalitis lethargica, epidemic cerebrospinal meningitis, epidemic or septic sore throat, measles, poliomyelitis, acute anterior (infantile paralysis), scarlet fever, smallpox and whooping cough. It shall be the duty of the physician in attendance on any case suspected by him to be diphtheria, *encephalitis lethargica*, epidemic cerebrospinal meningitis. epidemic or septic sore throat, measles, poliomyelitis, acute anterior (infantile paralysis), scarlet fever, smallpox, or whooping cough to give detailed instruction to the nurse or other person in attendance in regard to the disinfection and disposal of the discharges from the nose, mouth and ears of the patient. Such instructions shall be given on the first visit and shall conform to the special rules and regulations of the state department of health. It shall be the duty of the nurse or person in attendance to carry out the disinfection in detail until its discontinuance is permitted by the local health officer.

Amended April 27, 1920, in effect June 1, 1920.

Regulation 19. Distribution of circulars. It shall be the duty of every health officer, as soon as a case of diphtheria, *encephalitis lethargica*, epidemic cerebrospinal meningitis, epidemic or septic sore throat, measles, poliomyelitis acute anterior (infantile paralysis), scarlet fever, smallpox, typhoid fever, typhus fever, or whooping cough is reported to him or as soon thereafter as possible, to give every family or individual living in the house or building, in which such case is, the circulars of information and copies of any rules and regulations, printed in a language understood by such individual, concerning such diseases which may be issued by the state department of health or the local health authorities. The health officer shall also notify every family or individual living in the house of the existence of such disease.

Amended April 27, 1920, in effect June 1, 1920.

Regulation 20. Posting placards. When a case of diphtheria, *encephalitis lethargica*, epidemic cerebrospinal meningitis, measles, poliomyelitis, acute anterior (infantile paralysis), scarlet fever, smallpox, whooping cough, or typhus fever exists in any house, or apartment, or room, it shall be the duty of the health officer to post upon such house or apartment or room, or rooms in which such case is isolated, near the entrance thereof, a placard, stating the existence therein of a communicable disease.

Amended April 27, 1920, in effect June 1, 1920.

Regulation 24. Exposure of person affected with communicable disease. No person shall permit any child. minor or other person under his charge, affected with diphtheria, *encephalitis lethargica*, measles, poliomyelitis, acute anterior (infantile paralysis), scarlet fever, smallpox or typhus fever, to associate with other than his attendants.

No person affected with any of said diseases shall expose himself in such manner as to cause or contribute to, promote or render liable their spread.

Amended April 27, 1920, in effect June 1, 1920.

Regulation 27. Exclusion from school and gatherings of cases of certain communicable diseases. No person affected with chickenpox, diphtheria, *encephalitis lethargica*, epidemic cerebrospinal meningitis, epidemic influenza, epidemic or septic sore throat, German measles, measles, mumps, poliomyelitis, acute anterior (infantile paralysis), scarlet fever, smallpox, trachoma, whooping cough, shall attend or be permitted to attend any public, private, or Sunday school, or any public or private gathering. Such exclusion shall be for such time and under such conditions as may be prescribed by the local health authorities, not inconsistent with the provisions of this code or the special rules and regulations of the state department of health.

Amended April 27. 1920, in effect June 1, 1920.

Regulation 28. Exclusion from schools and gatherings of children of households where certain communicable diseases exist. Every child who is an inmate of a household in which there is or has been within fifteen days, a case of chickenpox, diphtheria, *encephalitis lethargica*, epidemic cerebrospinal meningitis, German measles, measles, mumps, poliomyelitis, acute anterior (infantile paralysis), scarlet fever, smallpox, or whooping cough, shall be excluded from every public, private or Sunday school and from every public or private gathering of children for such time and under such conditions as may be prescribed by the local health authorities, not inconsistent with the provisions of this code or the special rules and regulations of the state department of health.

Amended April 27, 1920, in effect June 1, 1920.

Regulation 32. Removal to hospital or isolation and restriction of visiting in certain cases. It shall be the duty of the health officer to remove, or cause to be removed, every case of diphtheria, *encephalitis lethargica*, measles, scarlet fever or poliomyelitis, acute anterior (infantile paralysis), promptly to a suitable hospital, or to see that such case is properly isolated. Such isolation shall be maintained until its discontinuance is permitted by the health officer.

No person, except the physician and nurse or other person in attendance, shall be permitted to come in contact with or to visit a case of diphtheria, *encephalitis lethargica*, measles, scarlet fever or poliomyelitis, acute anterior (infantile paralysis), except by permission of the health officer.

Amended April 27. 1920. in effect June 1, 1920.

Regulation 34. Quarantine in certain emergencies. When any case of diphtheria, *encephalitis lethargica*, epidemic cerebrospinal meningitis, measles. scarlet fever, smallpox, poliomyelitis, acute anterior (infantile paralysis), or typhus fever is not or cannot be properly isolated on the premises and cannot be removed to a suitable hospital, it shall be the duty of the local health officer to forbid any member of the household from leaving the premises. except under such conditions as he may specify and except as provided by regulation twelve of this chapter.

Amended April 27. 1920, in effect June 1, 1920.

Regulation 37. Sale of foods forbidden in certain cases. When a case of diphtheria. *encephalitis lethargica*. epidemic or septic sore throat, amoebic or bacillary dysentery, epidemic cerebrospinal meningitis, para-typhoid fever, scarlet fever. smallpox. poliomyelitis, acute anterior (infantile paralysis), or typhoid fever exists on any farm or dairy producing milk, cream. butter, cheese. or other foods likely to be consumed raw, no such foods shall be sold or delivered from such farm or dairy, except under the following conditions:

(a) That such foods are not brought into the house where such case exists;

(b) That all persons coming in contact with such foods eat, sleep and work wholly outside such house;

(c) That such persons do not come in contact in any way with such house or its inmates or contents;

(d) That said inmates are properly isolated and separated from all other parts of said farm or dairy, and efficiently cared for; and

(e) That a permit be issued by the health officer.

Amended April 27, 1920, in effect June 1, 1920.

Regulation 38. Destruction of foods in certain cases. When a case of diphtheria, *encephalitis lethargica*, epidemic or septic sore throat, amoebic or bacillary dysentery, epidemic cerebrospinal meningitis, para-typhoid fever, smallpox, poliomyelitis, acute anterior (infantile paralysis), or typhoid fever exists on any farm or dairy producing milk, cream, butter, cheese or other foods likely to be consumed raw, the state commissioner of health or the local health officer may destroy or order the destruction of any such foods which in his opinion may have been so contaminated as to be a source of danger.

Amended April 27, 1920, in effect June 1, 1920.

Regulation 39. Handling of food forbidden in certain cases. No person affected with any communicable disease shall handle food or food products intended for sale, which are likely to be consumed raw or liable to convey infective material.

No person who resides, boards, or lodges in a household where he comes in contact with any person affected with bacillary dysentery, diphtheria, *encephalitis lethargica*, epidemic or septic sore throat, para-typhoid fever, scarlet fever, poliomyelitis, acute anterior (infantile paralysis), or typhoid fever, shall handle food or food products intended for sale.

No waiter, waitress, cook, or other employee of a boarding house, hotel, restaurant, or other place where food is served, who is affected with any communicable disease shall prepare, serve, or handle food for others in any manner whatsoever.

No waiter, waitress, cook or other employee of a boarding house, restaurant, or other place where food is served, who lodges or visits in a household where he comes in contact with any person affected with bacillary dysentery, diphtheria, *encephalitis lethargica*, epidemic or septic sore throat, para-typhoid fever, scarlet fever, poliomyelitis, acute anterior (infantile paralysis), or typhoid fever, shall prepare, serve or handle food for others in any manner whatsoever.

Amended May 27, 1920, in effect June 15, 1920.

Regulation 40. Carriers of disease germs. Any person who is a carrier of the disease germs of Asiatic cholera, bacillary dysentery, diphtheria, *encephalitis lethargica*, epidemic cerebrospinal meningitis, poliomyelitis, acute anterior (infantile paralysis) or typhoid fever, shall be subject to the special rules and regulations of the state department of health.

Amended April 27, 1920, in effect June 1, 1920.

Regulation 41. Reports of botulism and other food poisoning. Every physician, visiting nurse, public health nurse, and every superintendent or *other* person in charge of any hospital, institution, dispensary, *laboratory*, labor *camp* or other camp, *who* shall have knowledge of the occurrence of *a case of botulism or of a* number or group of cases of *other* severe or fatal illness believed to have been due to the consumption of spoiled or poisonous food, shall report the same immediately, by telephone or telegram, to the state commissioner of health, and to the local health officer.

Amended May 27, 1920, in effect June 15, 1920.

Regulation 49. Letting of rooms forbidden while contaminated with infective material. No proprietor of a hotel, boarding house, or lodging house shall let for hire or cause or permit anyone to occupy a room or apartment previously occupied by a person affected with diphtheria, *encephalitis lethargica*, epidemic cerebrospinal meningitis, measles, poliomyelitis, acute anterior (infantile paralysis), scarlet fever, smallpox, tuberculosis, or typhus fever, until such room or apartment has been cleansed, renovated, or disinfected, under the direction of the local health officer.

When an order requiring the cleansing, renovation or disinfection of articles or promises is not complied with, the local health officer shall post a placard on the premises, reading as follows:

"Notice: These apartments have (or this room has) been occupied by a person affected with . . . . They (or it) must not again be occupied until orders for cleansing, renovation, or disinfection have been complied with. This notice must not be removed under penalty of the law.

Date ....

..........................Health Officer."

Amended April 27, 1920, in effect June 1, 1920.

CHAPTER IV

Midwives

Regulation 3. Registration required after issuance of license and change of address. On and after the first day of January, 1915, every licensed midwife shall register her name and address with the registrar of vital statistics *of the district wherein she resides and of each district wherein she engages in the practice of midwifery,* within ten days after the issuance of such license and after any change in her address.

Amended March 9, 1920, in effect April 1, 1920.

Regulation 5. Qualifications required of applicant for license on and after the first day of January, 1915. On and after the first day of January, 1915, every applicant for a license to practice midwifery must possess the following qualifications:

(a) Be not less than twenty-one years of age:

(b) Be able to read and write, provided that in cases of persons of foreign birth, who have extended experience or in other exceptional circumstances this requirement may be waived by the public health council;

(c) Be clean and constantly show evidence, in general appearance *and in their homes,* of habits of cleanliness;

(d) Either

(1) Possess a diploma from a recognized school for midwives; or

(2) Have attended, under the instructions of a duly licensed and registered physician, not less than fifteen cases of labor and have had the care of at least fifteen mothers and newborn infants during lying-in periods of at least ten days each, and shall present a written statement from said physician or physicians that she has received such instruction in said fifteen cases with the name, date and address of each case and that she is reasonably skillful and competent; or

(3) Present other evidence satisfactory to the state commissioner of health of her qualifications; and

(e) Present evidence satisfactory to the state commissioner of health of good moral character, vouched for by at least two reputable citizens.

Amended May 27, 1920, in effect June 15, 1920.

CHAPTER VI

Nuisances Which May Affect Life and Health

Regulation 1. Local health officer to investigate all complaints. The local health officer, upon receiving a complaint of the existence within his jurisdiction of a nuisance, which may affect health, or when the probable existence of any such nuisance comes to his attention, shall make an immediate and thorough investigation, *and if, in his opinion,* such a nuisance exists, he shall take *steps* to secure its *voluntary* abatement.

Amended June 14, 1920, in effect July 1, 1920.

Regulation 2. Health officer to file report with local board. *The health officer shall also within five days of the receipt of the complaint or of the discovery of the probable existence of a nuisance which may affect health, unless the nuisance has in the meantime been abated and the complainant satisfied, file with the local board of health:*

(a) *the complaint, if made in writing, if not in writing, a summary thereof; or, if no complaint has been made, a statement of the facts, and*

(b) *a report showing*
(i) *his findings of the facts;*
(ii) *his opinion as to whether or not the conditions constitute a nuisance likely to affect health;*
(iii) *the steps, if any, already taken to abate the nuisance;*
(iv) *whether in his opinion the nuisance has been abated.*

Added June 14, 1920, in effect July 1, 1920.

Regulation 3. Action to be taken by local board. *Within five days of the filing of the report provided for in regulation 2 of this chapter, the local board of health shall convene, and*

(a) *examine into the alleged nuisance;*
(b) *render its conclusion whether or not the conditions constitute a nuisance which may affect health;*
(c) *furnish the owner, agent or occupant of the premises on which the nuisance is alleged to exist, with a written statement of the results of its examination and conclusions;*
(d) *order the suppression or removal of the nuisance if a nuisance is concluded to exist;*
(e) *enter upon its minutes its conclusions and its order if one is made;*
(f) *serve a copy of any such order upon the owner or occupant of the premises upon which such nuisance is found to exist or cause the same to be conspicuously posted thereon.*

Added June 14, 1920, in effect July 1, 1920.

Regulation 4. Health officer to report to state commissioner of health. *Within forty-eight hours after the entry of any decision of the board declaring the conditions not to be a nuisance affecting health, or if within five days of the filing of the report of the health officer with the local board of health said board fails to take action provided by regulation 3 of this chapter the health officer shall forward a copy thereof to the state commissioner of health, together with the original or copies of his report and other papers filed by him with the local board, as required in regulation 2 of this chapter.*

Added June 14, 1920, in effect July 1, 1920.

Regulation 5. State commissioner of health may direct local board of health to take certain definite proceedings. *If, in the opinion of the state commissioner of health, the conditions complained of constitute a nuisance likely to affect health and the abatement or removal thereof is necessary for the public good and for the protection of life and health, the said commissioner may, by notice to the presiding officer of the local board of health, direct him, pursuant to section 26 of the public health law, to convene such local board to take certain definite proceedings concerning which the said commissioner is satisfied that the action recommended by him is necessary for the public good and is within the jurisdiction of such local board of health.*

Added June 14, 1920, in effect July 1, 1920.

Regulation 6. Presiding officer to convene local board and take action directed. *Upon the receipt of such notice from the state commissioner of health, the presiding officer of the local board of health, shall promptly convene such local board, which shall take the action directed by the said commissioner.*

Added June 14, 1920, in effect July 1. 1920.

CHAPTER VII

Miscellaneous

Regulation 2. Common towel forbidden. No person, firm, corporation *or authorities* owning, in charge of, or in control of any lavatory or wash room in any hotel, lodging house, restaurant, factory, *school,* store, office building, railway or trolley station, or public conveyance by land or water shall provide in or about such lavatory or wash room any towel for common use. The term " common use " in this regulation shall be construed to mean, for use by more than one person without cleansing.

Amended April 27, 1920, in effect June 1, 1920.

DIVISION OF COMMUNICABLE DISEASES

DIVISION OF COMMUNICABLE DISEASES

HERMANN M. BIGGS, M. D., *Commissioner of Health, Albany, N. Y.:*

SIR.— I have the honor to submit the following report for the Division of Communicable Diseases for the year 1920.

Respectfully,

EDWARD S. GODFREY, JR.

Director

July 14, 1921

COMMUNICABLE DISEASES

The year 1920 had hardly gotten under way when articles began to appear in the press of an unusual incidence of influenza in the middle west. As there was some doubt as to the verity of the reported conditions, and particularly as to the type of disease stated to be prevalent, one of the Department's epidemiologists was sent to Chicago to investigate. He reported that the disease was undoubtedly influenza, though apparently less severe than in 1918, and that the outbreak was of epidemic proportions.

On receipt of this report immediate steps were taken to locate physicians and nurses who would be available for emergency work in districts that might be affected by the epidemic and insufficiently supplied with medical and nursing service. The weather conditions at the time were the worst imaginable, the roads throughout the greater portion of the State being in an almost impassable condition. The Department contributed the services of two physicians to several communities in the northern part of the State which were either entirely without physicians or were so inadequately supplied that the sick could not be visited. The epidemic continued for a period of seven weeks. It began in the last week of January and commenced to decline in the third week of February. The mortality was considerably less than in the 1918 outbreak. Although there were no actual figures obtained to support the belief, it was the opinion of a number of observers that those who suffered from the disease in 1918–19 appeared to possess a considerable immunity to the disease.

TYPHOID FEVER

The typhoid death rate of 4.7 per hundred thousand is the lowest ever reported in the history of the State. The morbidity rate was practically the same as for the previous year, being 36 per 100,000. There was a decline in the case fatality also from 14.3 to 13.0. The seasonal incidence varied from that which has been usual in recent years, probably on account of three waterborne outbreaks which occurred in the cities of Schenectady, Mechanicville and Mount Vernon during the month of April. The number of cases for April, 1920, was more than three times as great as in the corresponding month of the preceding year. The counties with the highest case rates were Allegany, Columbia, Greene, St. Lawrence, Saratoga, Schenectady, Seneca and Tioga. With the exception of Allegany and Greene counties these high rates were due to well marked outbreaks which occurred in individual localities situated in these counties and are described in detail hereafter.

During the year waterborne outbreaks of typhoid fever were reported from Amsterdam, Mount Vernon, Mechanicville, Schenectady, Seneca Falls and Whitesboro. Milkborne typhoid epidemics occurred in Babylon, Owego and at Niagara University in the town of Lewiston. An outbreak of paratyphoid due to milk infection was noted at Chatham; ice cream was thought to have been the cause of the outbreak at Conifer, St. Lawrence county. Small outbreaks in Theresa, Shortsville, Amityville and among the crew of a Hudson River steamer were also investigated.

DIPHTHERIA

The mortality rate from diphtheria was the highest since 1907, due to the continued epidemicity of this disease in the city of Buffalo and vicinity. Including Buffalo, this rate was 18.0 and exclusive of this city 11.6 per 100,000. The mortality rate for Buffalo itself was 59.7 per 100,000. The mortality rate for Erie County was 52 per 100,000. The morbidity rate was slightly lower than for 1919 — 222 as against 227 per 100,000. About one-third of the cases and more than one-third of the deaths occurring in the State, exclusive of New York city, occurred in the city of Buffalo. Diphtheria began to be epidemic in Buffalo apparently in the summer of 1918 and reached what might be termed epidemic proportions in January 1919, since which time it has continued with remissions during the summer months up until the close of the year. Niagara county and Cayuga county also had death rates in excess of the upstate death rate, the former very largely due to an excessive rate in the city of Niagara Falls. A milkborne outbreak of diphtheria occurred in Westchester county treaceable to a certified milk. This milk was delivered principally in the city of White Plains and Port Chester in this state and Greenwich, Conn. In each of these places there was an explosive outbreak of diphtheria at about the same time. The milk was certified by the Westchester County Medical Society and was unpasteurized.

SCARLET FEVER

The morbidity rate was the highest since 1917 and with that exception the highest since 1911. The death rate, 4.7 per 100,000, was the highest since 1914. For the previous five years this rate had been below 3 per 100,000. The case fatality rate (2.6 per cent) was likewise the highest since 1914, it having been with the exception of 1918, below 2 per cent for the preceding five years. High morbidity rates were observed in Cortland county, 654 per 100,000, Niagara 476, Jefferson 346, Ontario 359, Onondaga 298. The lowest rates were in Washington and Warren counties — 22 and 38 per 100,000 respectively. High mortality rates were observed in Saratoga county — 33 per 100,000; Jefferson 16. There were no deaths from scarlet fever in 16 of the 57 up-state counties. The highest case fatality rate was in Saratoga county — 11.8, which was also the county with the highest mortality rate. The disease was quite prevalent in the city of Mechanicville throughout the year.

In a number of counties extensive series of cases occurred with low case fatality rates, the most striking example being Orange county with 346 cases and 2 deaths; a case fatality rate of .58 per cent. A well marked outbreak in the city of Middletown, located in this county was promptly brought under control when a state sanitary supervisor took charge.

MEASLES

The aggregate of the reported measles cases was, with two exceptions, the largest up-state since 1908. The death rate was 72.6 per 100,000, slightly above the median for thirteen years. The case fatality rate was the lowest on record. The seasonal incidence was unusual in that the peak was reached in June, whereas in previous years the cases started to decline in April or May. It is possible that this seasonal variation may have had some influence on the decline in the case fatality rate although the important question of age distribution has not yet been determined. The highest case rate was observed in Oswego county 2270 per 100,000. Herkimer, Schuyler and Wayne counties were slightly less. The disease was also very prevalent in Broome, Niagara, Genesee and Ulster counties. The highest death rate was in Oswego county, 31 per 100,000.

The department has never conducted any adequate epidemiological investigations of measles outbreaks but it is contemplated that this shall be done during the current year.

WHOOPING COUGH

The morbidity rate of 286 per 100,000 from this disease was the highest since 1911 when this disease was made reportable. The case fatality rate of 2.84 was, however, the lowest of record excepting 1919. The death rate, 8.1, was below the mean though greatly in excess of the exceptional low rate of 1919. There was nothing remarkable in the seasonal incidence of the disease except the very great increase of cases in November and December. High morbidity rates were observed in Allegany county — 779 per 100,000, Broome 645, Niagara 606, Jefferson 580, Wyoming 562, Chemung 531, Chautauqua 519. No cases were reported from Hamilton county. As the population of this county is less than 5,000 no special significance is attached to it. The counties with the high mortality rates were Dutchess 23 per 100,000, Cayuga 26, Cattaraugus 18, Broome 16. No deaths were reported from 7 counties. High case fatality rates were found in Cayuga 9.7, Dutchess 6.7, Oswego 6.7, Onondaga 6.1. More or less extensive series with low death rates were observed in Chautauqua county, 601 cases with 6 deaths, Genesee 101 cases with 1 death, Rockland 191 cases with 1 death, Livingston 127 cases, 1 death, Tioga 123 cases, 1 death, Sullivan 85 cases, no deaths. Some of the high case fatality rates unquestionably are due to poor reporting. On the other hand as it not infrequently happens that no physician is called to attend whooping cough cases and many are not reported for this reason, it is believed that the absence of adequate medical care also contributes to a higher case fatality rate. No careful epidemiological investigations have been made of whooping cough outbreaks during the year, but it is hoped that something along this line may be accomplished during 1921.

SMALLPOX

There were two hundred and eighty-one cases of smallpox reported during the year 1920. The disease was scattered throughout the State and it was found necessary to certify an epidemic in the towns of Royalton, Bombay, Parma and Ogden.

The declaration of an epidemic at Brockport and surrounding towns which was certified by the State Commissioner of Health on December 19, 1919, was withdrawn in February, 1920.

SMALLPOX — NEW YORK STATE — 1920

COUNTIES, TOWNSHIPS AND CITIES	Number of cases reported	VACCINATION HISTORY OF CASES: Number vaccinated within seven years preceding attack	Number last vaccinated more than seven years preceding attack	Number never successfully vaccinated	Vaccination history not obtained or uncertain
Albany county					
Albany, city	4	....	....	3	1
Cattaraugus county					
Allegany, town	1	....	1	....	....
Yorkshire, town	2	....	....	2	....
Cayuga county					
Auburn, city	1	....	....	....	1
Chautauqua county					
Stockton, town	1	....	....	1	....
Chemung county					
Elmira Heights, village	9	....	....	9	....
Elmira, city	9	....	2	7	....
Horseheads, town	17	....	6	11	....
Southport, town	1	....	....	1	....
Cortland county					
Homer, village	2	....	....	2	....
Delaware county					
Kortwright, town	2	....	....	1	1
Erie county					
Buffalo, city	56	....	....	54	2
Lackawanna, city	1	....	....	1	....
Tonawanda, town	5	....	....	5	....
Tonawanda, city	2	....	....	2	....
Sardinia, township	3	....	....	3	....
Hamburg, town	1	....	....	....	1
Collins, town	1	....	....	1	....
Elma, town	1	1	....	....	....
Lancaster, village	1	....	....	....	1
West Seneca, town	1	....	....	1	....
Essex county					
Lake Placid, village	1	....	....	....	1
Franklin county					
Ft. Covington, village	17	....	2	15	....
Ft. Covington, town	12	....	....	12	....
Malone, village	1	....	....	....	1
Moira, town	1	....	....	1	....
Bombay, town	8	....	....	6	2
Brandon, town	1	....	....	1	....
Genesee county					
Batavia, town	5	....	....	5	....
Bergen, town	2	....	....	2	....
Oakfield, village	1	....	....	1	....
Herkimer county					
Middleville, village	6	....	1	5	....
Jefferson county					
Pamelia, village	2	....	....	2	....
Lewis county					
Croghan, village	1	....	....	....	1
Hinckley, town	1	....	....	....	1
Copenhagen, village	4	....	....	4	....
Livingston county					
Groveland, town	1	....	....	1	....
Monroe county					
Rochester, city	3	....	....	3	....
Hamlin, town	6	....	1	5	....
Ogden, town	2	1	....	1	....
Sweden, town	4	....	....	4	....
Brockport, village	11	....	....	11	....
Parma, town	3	....	2	1	....
Niagara county					
Niagara Falls, city	14	....	....	14	....
Royalton, town	5	....	....	5	....
Newfane, town	1	....	....	1	....
La Salle, village	1	....	....	1	....
Oneida county					
Utica, city	1	....	....	1	....
Clinton, village	1	....	....	1	....
Whitestown, town	5	....	....	5	....

SMALLPOX — NEW YORK STATE — 1920 — (*continued*)

COUNTIES, TOWNSHIPS AND CITIES	Number of cases reported	Vaccination History of Cases: Number vaccinated within seven years preceding attack	Number last vaccinated more than seven years preceding attack	Number never successfully vaccinated	Vaccination history not obtained or uncertain
Onondaga county					
DeWitt, town	1	....	....	1	....
Syracuse, city	1	....	1	....	....
Onondaga, town	1	....	....	....	1
Ontario county					
Canandaigua, city	1	....	....	1	....
Otsego county					
Oneonta, city	1	....	....	1	....
Orange county					
Newburgh, town	3	....	....	3	....
Warwick, village	6	....	....	6	....
St. Lawrence county					
Norfolk, town	6	....	1	4	1
Gouverneur, village	1	....	1	....	....
Piercefield, village	2	....	....	2	....
Saratoga county					
Providence, town	1	1	....	....	....
Steuben county					
Hammondsport, village	1	....	....	1	....
Hornell, city	2	....	....	2	....
Tompkins county					
Ithaca, city	7	....	2	5	....
Ulster county					
Woodstock, town	1	....	1	....	....
Washington county					
Cambridge, village	1	....	....	1	....
Westchester county					
New Rochelle, city	2	....	....	2	....
New York city	24	....	....	....	24
Total	305	3	21	242	39

SANITARY SUPERVISORS

In addition to being charged with the control of communicable diseases, this Division has supervision of the fifteen sanitary supervisors of the Department.

The sanitary supervisor is the field representative of the Department in all the phases of its work. While his first duty is to limit the spread of communicable diseases to the community within which it arises and to as few people as possible in that community, he is expected even more to raise the health administration of such a place to a position of justifiable self-reliance. This is the foundation upon which the superstructure of other not less important activities is to be raised. He promotes the cause of child welfare, of venereal disease control, of improved water supplies, of safe sewage disposal, of better laboratory facilities, of adequate nursing service and of tuberculosis hospitals, dispensaries and clinics. As means to these ends he secures the cooperation of the press, and addresses meetings of clubs and associations and gatherings called together specifically for the consideration of public health questions. He attends meetings of medical societies, confers with town and village boards, interviews city officials and maintains contact with voluntary organizations interested in the advancement of public health. Through correspondence, through monthly reports, through the weekly summaries of disease prevalence, personal visit to each district during the year he keeps in touch with the work of his health officers, stands ready to advise and to assist them in every way compatible with community self-respect.

During 1920 the sanitary supervisors made 496 visits on account of communicable diseases. These visits have been for purposes of diagnosis in doubtful cases, to advise in the management of outbreaks, to conduct epi-

demiological investigations and in some instances to bring local authorities to a sense of their responsibilities. With the exception of such exotic infections as Asiatic cholera, yellow fever and the like, these investigations have included practically every disease listed as communicable in the Sanitary Code. This work necessitates not only a broad knowledge of practical epidemiology, but a high degree of diagnostic ability as well. It is not surprising therefore that the sanitary supervisors have been, on occasion, the means of correcting mistakes in diagnosis and thus directing treatment along lines that have promptly resulted in recoveries.

Six of the sanitary supervisors gave local direction to healthmobile tours in their districts, assisting with the children's examinations and speaking at the accompanying meetings. This work has had the important advantage of bringing to the health officers and public of the rural districts a form of health conservation usually found only in the cities. Altogether the supervisors have promoted, directed or assisted in the conduct of 294 clinics, of which 121 were for child welfare, 65 for tuberculosis and 108 for miscellaneous classes; 99 of the child welfare clinics were held in connection with the healthmobile.

The sanitary supervisors made 397 visits to public health nurses, including many employed by voluntary organizations as well as by public authorities for the purpose of assisting with advice and direction. An important part of the sanitary supervisor's work is stimulating the employment of public health nurses by local boards of health, explaining the functions that such nurses perform and the advantages that may be expected. Two hundred and eighty-nine conferences with members of town and village boards have been held covering practically every activity that such boards may consider. In addition, 194 meetings of other organizations have been attended in one capacity or another and there have been held 1134 miscellaneous conferences with individuals on public health matters. The purpose of these conferences has been usually to direct properly the activities of voluntary organizations engaged in health work, coordinating the activities of public and private effort.

The sanitary supervisors have given 335 addresses, which have ranged from talks to school children to technical discussions before medical societies. They have attended 89 meetings of medical societies in practically all of which they have presented either in an original paper or in the discussion the public health side of some medical question. Ninety-three complaints have been investigated, most of them on account of local nuisances. As complaints requiring investigations are usually evidences of weakness in local health administration it is gratifying to find that they are not more numerous and that there is evidence of their growing fewer in number from year to year.

During the year seventeen consolidations were effected, the largest number for any year since the consolidation law went into effect, with the exception of 1916. These consolidations have been accomplished usually only after considerable effort has been expended in educating local boards of health. While in themselves they mean little, consolidated districts do afford a better foundation upon which to build an effective local health organization. By having a larger area and population the overhead is reduced and the employment of a public health nurse, for example, which neither district could afford separately may be economically taken care of by using the combined resources.

Of the 965 health officers of the State, 845 have been visited at least once, the supervisor going over with each individual his records, supplies and local problems. This data has been transmitted to the department on a form provided for that purpose. With very few exceptions a report has been made covering the salient features of each health district in the State. The large number of health officers included in each supervisor's territory and the difficulty of reaching the more remote ones at a time when the health officer was at home has been the only reason that the score has not been perfect. A special effort has been made to visit each new health officer soon after the receipt of notice of appointment not only to give him instruction in his

duties but that the Public Health Council might have an intelligent and unprejudiced report on the applicant's qualifications. In every instance before taking final action on health officers who have been delinquent in the performance of their duties, the sanitary supervisor has made one or more personal visits in an effort to correct the faults. With rare exceptions they have been successful, and in only a few instances has it been found necessary to institute further proceedings.

The post-graduate courses for health officers conducted in connection with the Albany Medical College and Syracuse University have been directed by two of the sanitary supervisors. The Albany class for this year comprised 50 students who completed the course; Syracuse had 34. Practically all the health officers in the central part of the State have taken the Syracuse course during the four years it has been running, this accounting for the small classes in 1920. The value of these courses is attested both by the better work done by the graduates and by the fact that many of those who have completed the course return to attend additional lectures in subsequent years.

While the statistical report of the work of the sanitary supervisors which follows is of value, it is obvious that no such report can indicate clearly all of the important services rendered. Not the least important among the duties of the sanitary supervisor is that of maintaining cordial relations and a spirit of co-operation among the various elements in his district. The skill and tact with which such inconspicuous service is rendered contribute materially to the support accorded to the Department and its activities.

"Office work" appears prominently in the following table, consuming approximately one-sixth of the total number of hours or approximately one day weekly. Much of the time spent by the supervisor in his office is devoted to official correspondence, study and preparation of reports, preparation of addresses, interviews with health officers and others regarding matters pertaining to health administration, either in person or by telephone, etc. The office of the district sanitary supervisor is usually made a local clearing house for information concerning matters in any way related to public health. For example, the supervisor may be called upon for assistance in securing the admission of tuberculosis patients to hospitals; for advice to physicians in regard to the treatment of cases of communicable disease; for information to public health officials or others in regard to interpretation of the state laws or local regulations. He is often called upon to receive complaints to be transmitted to local health officers; to advise individuals and organizations in regard to the organization of social service projects indirectly related to public health; to furnish current information to newspapers or to confirm or explain news items secured by correspondents, etc. In many instances supervisors are directly connected with local activities as members of boards and committees, all of which contribute to their usefulness as officials. A considerable part of the time spent by supervisors in their offices could properly and should be credited under other headings such as "control of communicable diseases," "conferences and interviews," "advice and assistance to health officers," etc.

In connection with the work of the sanitary supervisor there is considerable amount of very necessary routine office work, which under present conditions, must be done very largely by the supervisor himself at the sacrifice of time which he might well devote to the numerous activities calling for his special training and experience. This could be done by a clerical assistant. A clerk at a small salary could not only perform routine clerical work but could answer questions and attend to matters now demanding the supervisor's time and attention, keep the office of the supervisor open in his absence in the field, and by being informed as to his whereabouts, make it possible for health officers and for this Department to reach him promptly at all times.

At present the allowance for expense for clerical and stenographic service, is such that it is only possible for a supervisor to employ a clerk or stenographer for a few hours weekly and in many instances it is extremely difficult to secure such temporary services. We are of the opinion that to make it possible for each supervisor to employ a permanent clerk and stenographer would contribute materially to the latitude and effectiveness of the work of the staff of supervisors.

SUMMARY OF WORK OF SANITARY SUPERVISORS — 1920

	Jan.	Feb.	Mar.	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Total
Office work (days)	91	92½	96½	75½	72½	44½	50	40	76	42	63	81	824½
Visits on account of communicable disease	56	43	42	22	50	26	35	26	33	49	61	53	496
Outbreaks investigated	8	8	6	2	7	5	2	4	4	7	12	10	75
Visits to health officers	136	64	107	166	178	181	116	157	166	126	128	156	1,671
Visits to public health nurses	23	31	22	31	41	34	24	29	31	38	56	37	397
Conferences with members of town and village boards	10	16	22	26	49	40	18	21	16	15	28	28	289
Miscellaneous conferences	77	72	82	71	174	116	84	76	61	74	133	114	1,134
Addresses	16	15	16	33	53	37	22	17	14	34	43	35	335
Complaints investigated	3	1	1	3	11	8	8	20	6	11	14	7	93
Consolidations effected	2	3	1	......	1	3	2	1	2	......	......	2	17
Health officer conferences and medical society meetings	1	2	12	2	17	4	1	3	7	26	8	6	89
Primary district reports*	......	......	......	......	......	......	......	......	......	......	......	......	382
Hours in travel	715¾	456¾	627¼	697½	841	851½	704	826	932	909½	833¼	840	9,234½
Hours on duty	2,966	2,445	2,734½	3,088	3,185½	3,221½	2,422	2,623	3,025½	3,029½	3,081	3,052½	34,873¾
Clinics	3	4	7	15	35	49	33	41	16	43	38	10	204

* Not enumerated by months for 1920.

THE SCORING OF CITY HEALTH DEPARTMENTS

The scoring of the activities of the health departments of cities has been continued during the year and has proven of decided advantage in the administration of these departments. The score sheet as arranged for 1919 had been shown by the previous year's use to be not sufficiently elastic to cover both the large and the small cities and for this reason two score sheets were prepared for use in 1920, one for cities of 25,000 to 175,000, and one for 25,000 and less population. This change has been found to work well. Among the important developments resulting from the use of these scores has been an improvement in administration and in the prevention of much overlapping in carrying out the various activities of the health departments.

The score sheets not only reveal the good work of the various activities but also, as one of the health officers pertinently said, "it shows the holes as well." During and subsequent to the scoring a conference with the health officer was held in each city by Dr. Duryee and usually resulted in suggestions. These recommendations may be placed broadly into two classes, first, those relating to the problems of administration and which involve little or no increased expense and frequently result in economy of operation and second, those which involve some expense which arises from a proper conception of the nature of modern municipal public health administration and results in the attempt to secure well-rounded departments, in which a due proportion of importance is given to all the necessary activities.

A large proportion of the cities, through the efforts of the health officer, have adopted many of these suggestions with a distinct benefit to municipal health service. The effort to introduce the use of investigation cards relating to communicable diseases, and to secure their proper use has been successful and has definitely improved the investigation and control of these diseases. There have been conferences between the fiscal officers of the city, the health officer and the sanitary supervisor engaged in this work, which have resulted in a better understanding of local needs, and a greater appreciation of the value of the work being done by the local health department. It has been a common remark of city health officers that this opportunity of making a survey of their departments and an attempt to evaluate the same, is greatly appreciated by them and they have in general stated their opinion of the value of this method for securing better administration of health departments of cities. In nearly every instance the health officers have shown the utmost interest and have all assisted in the development of this phase of public health work.

Table I

Important Communicable Diseases in New York State, Up-State and New York City by Years, Giving Cases, Deaths and Rates

(Case and death rates per 100,000, case fatality rate per centum)

	New York State					Up-State					New York City				
	Cases	Deaths	Case rate	Death rate	Case fatality rate	Cases	Deaths	Case rate	Death rate	Case fatality rate	Cases	Deaths	Case rate	Death rate	Case fatality rate
Typhoid Fever															
1908	6,976	1,375	79	15.7	19.71	3,811	837	91	19.7	21.96	3,165	538	70	11.9	16.99
1909	7,897	1,315	88	14.7	16.65	4,284	751	100	17.4	17.53	3,613	564	77	12.1	15.61
1910	8,536	1,374	93	15.0	16.09	4,801	816	110	18.7	17.0	3,735	558	78	11.6	14.93
1911	8,083	1,316	86	14.1	16.28	4,426	771	100	17.5	17.42	3,657	545	74	11.1	14.90
1912	6,418	1,128	67	11.8	17.57	3,343	629	75	14.1	18.82	3,076	499	61	9.9	16.22
1913	6,248	1,018	64	10.5	16.29	3,605	656	80	14.5	18.20	2,643	362	51	7.0	13.69
1914	5,481	878	55	8.9	16.01	3,221	544	70	11.9	16.79	2,260	334	42	6.3	14.77
1915	5,484	775	54	7.7	14.13	3,028	442	65	9.5	14.60	2,456	333	45	6.1	13.55
1916	4,417	603	43	5.8	13.66	2,788	388	59	8.3	13.92	1,629	215	29	3.8	13.19
1917	4,293	588	41	5.6	13.69	2,851	361	60	7.6	12.66	1,442	229	25	3.9	15.88
1918	3,391	576	32	5.4	16.98	2,153	380	45	7.9	17.65	1,238	196	21	3.3	15.83
1919	2,551	364	23	3.3	14.26	1,697	243	35	4.9	14.32	854	121	14	2.0	14.17
1920	2,694	363	26	3.5	13.47	1,725	225	36	4.7	13.04	969	138	17	2.4	14.24
Diphtheria															
1908	20,759	2,473	236	28.2	11.91	4,390	710	104	16.7	16.17	16,369	1,763	362	38.9	10.77
1909	20,665	2,313	230	25.8	11.19	4,613	598	112	13.9	12.42	16,052	1,715	344	36.8	10.68
1910	22,630	2,433	247	26.6	10.75	5,404	718	124	16.5	13.29	17,226	1,715	359	35.8	9.96
1911	20,007	1,963	214	21.0	9.81	6,523	679	148	15.4	10.41	13,484	1,284	278	26.0	9.52
1912	18,927	1,624	198	17.0	8.58	5,394	498	121	11.1	9.23	13,533	1,126	267	22.2	8.32
1913	20,247	1,853	208	19.1	9.15	5,662	519	125	11.5	9.17	14,585	1,334	277	25.7	9.14
1914	22,537	2,015	227	20.3	8.94	5,408	523	118	11.4	9.68	17,129	1,492	321	28.0	8.71
1915	20,806	1,770	206	17.5	8.51	5,527	492	119	10.6	8.69	15,279	1,278	279	23.4	8.36
1916	19,133	1,524	186	14.8	7.97	5,612	493	119	10.5	8.78	13,521	1,034	241	18.4	7.64
1917	19,183	1,745	183	16.6	9.10	6,559	589	138	12.4	8.98	12,624	1,156	220	20.1	9.16
1918	14,533	1,772	136	16.6	12.19	5,079	527	105	10.9	10.37	9,454	1,245	161	21.2	13.17
1919	25,077	2,053	230	18.9	8.18	11,063	813	227	16.7	7.34	14,014	1,240	233	20.6	8.85
1920	24,808	1,905	237	18.2	7.68	10,642	860	222	18.0	8.08	14,166	1,045	250	18.4	7.38

SCARLET FEVER															
1908	30,403	1,668	346	19.2	5.48	7,467	341	176	8.5	4.57	22,936	1,327	507	29.3	5.78
1909	22,747	1,204	254	13.4	5.29	9,743	517	226	9.7	5.31	13,004	787	279	16.9	6.05
1910	31,504	1,616	344	17.7	5.12	12,220	664	280	15.3	5.43	19,284	952	403	19.9	4.93
1911	25,830	1,149	276	12.8	4.44	10,037	408	227	9.2	4.06	15,793	741	320	15.0	4.69
1912	18,579	789	195	8.3	4.24	5,863	174	131	3.9	2.97	12,716	615	251	12.1	4.83
1913	17,263	837	177	8.6	4.84	6,524	330	144	7.3	5.06	10,789	507	206	9.8	4.72
1914	18,596	687	187	6.9	3.69	7,491	235	163	5.1	3.14	11,105	452	208	8.5	4.07
1915	15,802	409	156	4.1	2.58	5,923	118	128	2.7	1.99	9,879	291	181	5.3	2.94
1916	11,083	178	108	1.7	1.61	5,268	82	112	1.7	1.55	5,815	96	104	1.7	1.65
1917	15,234	261	145	2.5	1.71	9,174	139	193	2.9	1.51	6,060	122	105	2.1	2.01
1918	10,098	300	95	2.8	2.97	5,638	122	117	2.5	2.16	4,460	178	76	3.0	3.99
1919	12,075	270	111	2.5	2.24	7,481	134	153	2.7	1.79	4,594	136	76	2.3	2.96
1920	15,186	445	145	4.3	2.93	8,649	225	181	4.7	2.60	6,537	220	115	3.8	3.37
WHOOPING COUGH															
1908	....	503	....	5.7	....	....	318	....	7.5	....	....	185	....	4.1	....
1909	....	783	....	8.7	....	....	382	....	8.9	....	....	401	....	8.6	....
1910	....	727	....	7.9	....	....	433	....	9.9	....	....	294	....	6.1	....
1911	8,362	819	89	8.8	9.79	5,116	436	116	9.9	8.46	3,246	383	66	7.8	11.79
1912	7,821	683	82	7.2	8.73	5,638	392	126	8.8	6.9	2,183	291	43	5.7	13.33
1913	9,018	822	93	8.5	9.11	5,520	402	122	8.9	7.21	3,498	420	67	8.1	12.00
1914	11,651	730	117	7.4	6.26	7,853	451	171	9.8	5.74	3,798	279	71	5.2	7.34
1915	13,338	759	132	7.5	5.69	6,567	363	141	7.8	5.53	6,771	396	124	7.2	5.84
1916	17,297	745	168	7.2	4.30	9,837	393	209	8.4	3.99	7,460	362	133	6.3	4.71
1917	18,355	886	175	8.4	4.82	12,758	401	268	8.4	3.14	5,597	485	97	8.4	8.66
1918	16,522	1,237	155	11.6	7.49	10,964	572	227	11.8	5.22	5,558	665	94	11.3	11.96
1919	7,283	293	67	2.7	4.02	5,615	132	115	2.7	2.35	1,668	161	28	2.7	9.65
1920	21,224	1,004	203	9.6	4.73	13,694	389	286	8.1	2.84	7,530	615	133	10.9	8.17
TUBERCULOSIS (ALL FORMS)															
1908	26,230	16,550	299	188.5	63.10	3,310	6,379	78	150.0	192.71	22,920	10,171	506	224.7	44.37
1909	32,915	16,117	367	179.8	48.96	6,937	6,158	161	143.3	88.91	25,979	9,949	557	213.5	38.28
1910	37,963	16,337	415	178.5	43.03	5,957	6,263	137	143.7	105.13	32,006	10,074	667	210.1	31.47
1911	33,299	16,548	356	177.1	49.69	8,796	6,299	199	142.7	71.61	24,513	10,249	497	207.9	41.81
1912	30,529	15,989	320	167.7	52.37	7,777	6,011	174	134.5	77.29	22,752	9,978	449	197.0	43.85
1913	31,123	16,152	320	166.1	51.89	8,449	6,129	187	135.4	72.54	22,674	10,023	436	192.8	44.20
1914	31,128	16,559	314	167.0	53.20	9,472	6,270	207	136.8	66.19	21,602	10,289	405	192.9	47.62
1915	33,736	16,445	335	162.7	48.74	11,595	6,195	250	133.5	53.43	22,141	10,550	405	187.4	46.29
1916	32,059	15,820	311	153.6	49.34	12,767	6,178	272	131.5	48.39	19,292	9,642	344	172.1	49.97
1917	28,686	16,556	273	157.8	57.71	11,272	6,417	237	135.0	56.92	17,414	10,139	303	176.4	58.22
1918	24,464	16,953	229	158.7	69.24	10,125	6,855	210	142.5	67.70	14,339	10,098	244	171.7	70.42
1919	25,482	14,352	234	131.9	56.32	10,912	5,855	224	120.0	53.66	14,570	8,497	242	141.1	58.32
1920	23,796	12,475	227	119.4	52.42	9,761	5,338	204	111.5	54.69	14,035	7,137	248	125.9	50.85

Table 1 — Concluded

IMPORTANT COMMUNICABLE DISEASES IN NEW YORK STATE, UP-STATE AND NEW YORK CITY BY YEARS, GIVING CASES, DEATHS AND RATES — *Concluded*

	New York State					Up-State					New York City				
	Cases	Deaths	Case rate	Death rate	Case fatality rate	Cases	Deaths	Case rate	Death rate	Case fatality rate	Cases	Deaths	Case rate	Death rate	Case fatality rate
Measles															
1908	58,738	1,175	669	13.4	2.0	20,265	203	476	4.8	1.0	38,473	972	850	21.5	2.52
1909	52,863	1,272	590	14.2	2.4	21,072	276	489	6.4	1.3	31,791	996	682	21.4	3.13
1910	69,878	1,285	763	14.0	1.83	34,062	511	782	11.7	1.5	35,816	774	747	16.1	2.16
1911	48,675	977	521	10.5	2.0	22,792	319	516	7.2	1.4	25,883	658	525	13.3	2.54
1912	65,060	1,050	682	11.0	1.6	26,042	377	582	8.4	1.45	39,018	673	770	13.3	1.72
1913	65,374	1,072	672	11 0	1.63	36,024	444	796	9.8	1.23	29,350	628	564	12.1	2.13
1914	47,883	839	483	8.5	1.75	22,090	280	482	6.1	1.27	25,793	559	484	10.5	2.15
1915	62,660	844	620	8.3	1.34	24,474	214	527	4.6	.87	38,186	630	698	11.5	1.64
1916	67,110	928	651	9.0	1.38	45,507	439	969	9.3	.96	21,603	489	386	8.7	2.26
1917	60,860	892	580	8.5	1.46	33,341	335	701	7.0	1.0	27,519	557	479	9.7	2.02
1918	74,869	1,293	701	12.1	1.73	46,194	504	961	10.4	1.09	28,675	789	487	13.4	2.75
1919	19,882	354	183	3.3	1.78	11,688	136	240	2.8	1.16	8,194	218	136	3.6	2.66
1920	78,481	1,098	751	10.5	1.4	43,398	362	907	7.6	.83	35,083	736	619	12.9	2.1

Table 2

Important Communicable Diseases Reported by Months for Up-State, New York City and Entire State, 1908–1820

TYPHOID FEVER

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
3													
Up-State:													
1908	288	293	217	174	191	236	211	449	532	541	342	337	3,811
1909	316	243	262	181	171	173	256	476	761	667	435	343	4,284
1910	302	272	305	202	187	188	240	586	843	780	521	375	4,801
1911	310	380	352	246	217	213	315	641	649	463	312	328	4,426
1912	245	174	235	309	287	125	248	422	444	446	215	192	3,342
1913	178	143	124	337	256	136	280	391	610	546	319	285	3,605
1914	203	163	226	229	232	178	216	391	519	439	251	174	3,221
1915	180	157	159	104	125	160	238	422	444	403	309	327	3,028
1916	140	148	100	179	157	194	248	393	514	307	216	192	2,788
1917	178	210	212	150	119	143	232	373	502	363	220	149	2,851
1918	90	97	135	140	143	93	144	280	388	362	153	128	2,153
1919	88	69	60	53	69	97	159	276	364	264	114	84	1,697
1920	71	36	50	180	74	103	100	192	383	239	178	119	1,725
New York City:													
1908	146	125	140	11	121	176	306	507	665	382	244	242	3,165
1909	199	98	127	77	190	163	218	375	1,119	453	432	162	3,613
1910	154	294	152	120	187	168	246	617	614	513	468	202	3,735
1911	110	141	97	100	147	199	326	766	519	430	480	342	3,657
1912	238	142	101	125	127	164	273	585	538	390	198	195	3,076
1913	79	78	65	67	92	86	137	229	728	631	289	162	2,643
1914	100	75	64	127	108	147	200	303	470	337	170	159	2,260
1915	107	84	90	81	74	117	191	509	423	429	184	167	2,456
1916	66	63	66	86	116	115	132	258	281	223	133	90	1,629
1917	79	98	43	61	106	84	93	185	365	178	87	63	1,442
1918	30	28	35	53	51	164	170	265	209	125	52	56	1,238
1919	36	20	17	28	32	39	77	115	199	144	106	41	854
1920	47	14	25	26	29	51	78	199	196	142	92	70	969
Entire State:													
1908	434	418	357	285	312	412	517	956	1,197	923	586	579	6,976
1909	515	341	389	258	361	336	474	851	1,880	1,120	867	505	7,897
1910	456	566	457	322	374	356	486	1,203	1,457	1,293	989	577	8,536
1911	420	521	449	346	364	412	641	1,407	1,168	893	792	670	8,083
1912	483	316	336	434	414	289	521	1,007	982	836	413	387	6,418
1913	257	221	189	404	348	222	417	620	1,338	1,177	608	447	6,248
1914	303	238	290	356	340	325	416	694	989	776	421	333	5,481
1915	287	241	249	185	199	277	429	931	867	832	493	494	5,484
1916	206	211	166	265	273	309	380	651	795	530	349	282	4,417

Table 2 — Continued

IMPORTANT COMMUNICABLE DISEASES REPORTED BY MONTHS FOR UP-STATE, NEW YORK CITY AND ENTIRE STATE, 1908–1920 — *Cont'd*

TYPHOID FEVER — *Concluded*

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1917	257	308	255	211	225	227	325	558	867	541	307	212	4,293
1918	120	125	170	193	194	257	314	545	597	487	205	814	3,391
1919	124	89	77	81	101	136	236	391	563	408	220	125	2,551
1920	118	50	75	206	103	154	178	391	579	381	270	189	2,694

DIPHTHERIA

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Up State:													
1908	451	478	415	250	289	238	108	186	324	567	613	471	4,390
1909	480	419	383	303	266	316	267	239	317	458	584	581	4,613
1910	504	444	402	403	425	303	248	331	358	577	769	640	5,404
1911	602	497	433	382	481	476	398	435	539	703	790	787	6,523
1912	738	513	504	379	393	362	282	287	320	512	582	522	5,394
1913	549	458	454	413	391	350	325	271	397	713	532	809	5,662
1914	515	509	382	306	337	311	222	266	417	693	852	598	5,408
1915	560	430	464	319	392	336	268	250	381	713	760	654	5,527
1916	593	382	405	359	437	422	354	317	369	632	669	673	5,612
1917	635	521	556	458	444	384	369	350	516	880	798	648	6,559
1918	485	363	463	402	408	375	336	277	349	502	457	662	5,079
1919	897	752	828	669	675	775	603	595	877	1,445	1,476	1,471	11,063
1920	1,082	587	782	616	768	746	491	452	499	1,030	1,859	1,730	10,642
New York City:													
1908	1,683	1,537	1,893	1,573	1,544	1,284	1,043	601	1,091	1,238	1,347	1,535	16,369
1909	1,926	1,613	1,735	1,281	1,325	1,583	859	677	974	963	1,715	1,401	16,052
1910	1,514	1,581	2,087	2,044	2,229	1,532	1,220	1,032	652	932	1,375	1,028	17,236
1911	1,335	1,692	1,350	1,235	1,686	1,152	811	914	613	753	1,214	1,139	13,894
1912	1,159	1,241	1,386	1,274	1,199	1,215	......	764	656	1,127	1,310	1,416	12,747
1913	1,642	1,449	1,455	1,466	1,474	1,310	962	715	734	918	806	1,654	14,585
1914	1,546	1,642	1,512	1,567	1,802	1,737	1,396	838	941	1,271	1,364	1,513	17,129
1915	1,435	1,533	1,610	1,352	1,341	1,634	1,120	768	722	1,081	1,293	1,390	15,279
1916	1,572	1,485	1,570	1,329	1,715	1,570	1,064	511	433	608	734	930	13,521
1917	1,109	1,194	1,211	1,132	1,267	1,198	934	660	680	1,086	1,091	1,062	12,624
1918	1,047	898	1,086	1,249	288	1,231	893	541	472	801	836	112	9,454
1919	1,327	1,359	1,609	1,412	1,607	1,294	800	603	582	868	1,062	1,491	14,014
1920	1,492	1,229	1,364	1,345	1,308	1,246	817	522	522	934	1,535	1,852	14,166

Entire State:													
1908	2,134	2,015	2,308	1,823	1,833	1,522	1,151	787	1,415	1,805	1,960	2,006	20,759
1909	2,406	2,032	2,118	1,584	1,591	1,899	1,126	916	1,291	1,421	2,299	1,982	20,665
1910	2,018	2,025	2,489	2,447	2,654	1,835	1,468	1,363	1,010	1,509	2,144	1,668	22,630
1911	1,937	2,189	1,783	1,617	2,167	1,628	1,209	1,349	1,152	1,456	2,004	1,926	20,417
1912	1,897	1,754	1,890	1,653	1,593	1,577	282	1,051	976	1,639	1,892	1,938	18,141
1913	2,191	1,907	1,909	1,879	1,865	1,660	1,287	986	1,131	1,631	1,338	2,463	20,247
1914	2,061	2,151	1,894	1,873	2,139	2,048	1,618	1,104	1,358	1,964	2,216	2,111	22,537
1915	1,995	1,963	2,074	1,671	1,733	1,970	1,388	1,018	1,103	1,794	2,053	2,044	20,806
1916	2,165	1,867	1,975	1,688	2,152	1,992	1,418	828	802	1,240	1,403	1,603	19,133
1917	1,744	1,715	1,767	1,590	1,711	1,582	1,303	1,010	1,196	1,966	1,889	1,710	19,183
1918	1,532	1,261	1,549	1,651	696	1,606	1,229	818	821	1,303	1,293	774	14,533
1919	2,224	2,111	2,437	2,081	2,282	2,069	1,403	1,198	1,459	2,313	2,538	2,962	25,077
1920	2,574	1,816	2,146	1,961	2,076	1,992	1,308	974	1,021	1,964	3,394	3,582	24,808

TUBERCULOSIS

Up-State:													
1908	256	284	330	279	309	347	137	207	226	305	271	359	3,310
1909	1,469	587	592	563	374	485	725	510	312	437	460	422	6,936
1910	167	458	523	451	452	514	490	485	454	710	511	742	5,957
1911	658	802	879	706	881	629	826	721	627	605	701	751	8,786
1912	515	577	657	611	706	779	789	601	651	790	547	554	7,777
1913	750	651	653	658	617	647	1,073	647	673	753	643	684	8,449
1914	779	676	808	878	750	877	726	678	756	1,145	709	744	9,526
1915	721	694	1,034	950	914	967	901	1,181	992	929	1,100	1,152	11,595
1916	902	1,203	1,106	1,259	1,344	1,444	1,114	1,090	930	828	827	720	12,767
1917	986	1,027	1,015	1,023	1,055	1,056	1,006	954	820	891	757	682	11,272
1918	823	709	897	1,111	1,097	998	977	996	712	635	568	602	10,125
1919	705	647	777	805	988	958	1,168	928	1,109	1,017	786	1,024	10,912
1920	723	631	714	904	1,074	1,025	929	741	856	834	666	664	9,761
New York City:													
1908	1,609	1,518	2,445	1,937	1,673	1,674	2,160	1,755	2,431	2,023	1,826	1,869	22,920
1909	2,270	1,765	2,505	2,452	2,297	2,298	1,913	2,019	2,352	1,839	2,483	1,786	25,979
1910	2,249	2,745	3,974	3,518	2,966	2,178	2,131	2,890	2,402	1,974	2,729	2,250	32,006
1911	2,380	2,860	2,340	2,068	2,638	1,745	1,773	2,309	1,768	1,593	2,033	1,690	25,197
1912	2,012	2,053	2,030	1,985	2,299	1,836	1,835	1,716	1,806	1,860	1,589	1,731	22,752
1913	2,015	1,883	2,460	2,353	2,019	1,927	1,868	1,515	1,666	1,773	1,663	1,532	22,674
1914	1,699	1,565	1,954	1,955	1,974	2,037	1,769	1,675	1,772	1,867	1,548	1,787	21,602
1915	1,849	2,009	2,303	2,202	1,985	1,880	1,818	1,487	1,935	1,615	1,448	1,610	22,141
1916	1,613	1,638	2,053	1,749	1,602	1,800	1,418	1,505	1,531	1,322	1,475	1,586	19,292
1917	2,011	1,292	2,000	1,174	1,266	1,310	1,469	1,804	1,119	1,491	1,385	1,093	17,414
1918	1,538	1,344	1,366	1,698	1,300	1,759	873	1,326	902	721	707	805	14,339
1919	1,270	1,294	1,500	1,374	1,311	1,260	869	1,123	775	1,573	1,207	1,014	14,570
1920	957	1,163	1,566	1,255	1,211	1,325	994	986	964	1,515	974	1,125	14,035

Table 2 — Concluded

IMPORTANT COMMUNICABLE DISEASES REPORTED BY MONTHS FOR UP-STATE, NEW YORK CITY AND ENTIRE STATE, 1908–1920 — *Concl'd*

TUBERCULOSIS — *Concluded*

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Entire State:													
1908	1,865	1,802	2,775	2,216	1,982	2,021	2,297	1,962	2,657	2,328	2,097	2,228	26,230
1909	3,739	2,352	3,097	3,015	2,671	2,783	2,638	3,529	2,664	2,276	2,943	2,208	32,915
1910	2,416	3,203	4,497	3,969	3,418	2,692	2,621	3,375	2,856	2,684	3,240	2,992	37,963
1911	3,038	3,662	3,219	2,774	3,519	2,374	2,599	3,030	2,395	2,198	2,734	2,441	33,983
1912	2,527	2,630	2,687	2,596	3,005	2,615	2,624	2,317	2,457	2,650	2,136	2,285	30,529
1913	2,765	2,534	3,113	3,011	2,636	2,574	2,941	2,162	2,339	2,526	2,306	2,216	31,123
1914	2,478	2,241	2,762	2,833	2,724	2,914	2,495	2,353	2,528	3,012	2,257	2,531	31,128
1915	2,570	2,703	3,337	3,152	2,899	2,847	2,719	2,668	2,927	2,604	2,548	2,762	33,736
1916	2,515	2,841	3,159	3,008	2,946	3,244	2,532	2,595	2,461	2,150	2,302	2,306	32,059
1917	2,997	2,319	3,015	2,197	2,321	2,366	2,475	2,758	1,939	2,382	3,142	1,775	28,686
1918	2,361	2,053	2,263	2,809	2,397	2,757	1,850	2,322	1,614	1,356	1,275	1,407	24,464
1919	1,975	1,941	2,277	2,179	2,299	2,218	2,037	2,051	1,884	2,590	1,993	2,038	25,482
1920	1,680	1,794	2,280	2,159	2,285	2,350	1,923	1,727	1,820	2,349	1,640	1,789	23,796
MEASLES													
Up-State:													
1908	2,408	3,011	3,713	4,141	3,803	1,389	313	142	74	141	403	727	20,265
1909	2,030	2,498	2,493	2,213	2,122	1,950	743	243	239	724	1,919	3,898	21,072
1910	5,991	5,481	5,565	3,895	4,065	3,608	1,215	322	220	442	1,011	2,247	34,062
1911	2,765	2,920	3,901	4,003	3,816	1,932	886	230	148	387	674	1,130	22,792
1912	2,161	2,207	3,008	3,404	4,012	3,390	1,702	552	354	886	1,716	2,650	26,042
1913	4,483	5,751	5,508	5,355	4,886	3,786	1,720	411	307	1,136	1,086	1,595	36,024
1914	2,847	3,068	3,506	3,407	3,393	2,353	1,139	589	289	347	378	774	22,090
1915	1,241	1,469	1,672	2,512	3,260	3,282	1,789	635	343	987	2,804	4,480	24,474
1916	5,170	5,450	6,908	7,553	7,418	6,180	3,399	656	226	323	848	1,376	45,507
1917	2,492	3,136	3,988	4,817	5,976	5,208	2,244	474	311	656	1,384	2,655	33,341
1918	3,503	4,093	7,317	8,831	9,871	5,849	4,150	1,088	342	510	363	277	46,194
1919	560	763	1,183	1,609	2,099	1,665	885	257	95	282	478	1,812	11,688
1920	3,172	3,447	3,945	4,758	7,091	7,243	3,776	1,040	440	1,079	2,991	4,416	43,398
New York City:													
1908	3,388	4,973	8,306	7,060	5,974	3,852	1,587	373	375	465	744	1,376	38,473
1909	2,336	2,263	4,383	4,840	4,911	6,208	1,952	788	449	436	1,338	1,892	31,791
1910	3,735	4,560	8,205	6,036	6,425	3,229	1,259	561	232	280	582	706	35,816
1911	1,303	2,059	2,756	4,027	6,543	3,445	1,858	790	317	355	803	1,627	25,883
1912	2,670	4,219	7,713	7,938	7,272	4,182	1,982	604	221	317	769	1,420	39,257
1913	2,126	2,169	4,369	5,256	6,231	4,471	1,991	576	283	384	548	946	29,350

1914	1,519	2,190	3,483	4,485	5,483	4,094	1,734	534	244	324	679	1,024	25,793
1915	1,355	2,067	5,053	7,849	9,088	7,602	2,486	615	270	325	581	895	38,186
1916	1,242	1,894	3,281	4,208	4,579	3,393	1,813	417	119	74	127	456	21,603
1917	899	1,871	3,914	4,634	5,736	4,355	1,368	480	214	362	870	2,816	27,519
1918	4,264	4,477	6,345	6,003	4,536	1,812	664	241	114	76	67	76	28,675
1919	146	170	264	456	978	604	355	175	125	371	1,106	3,444	8,194
1920	7,756	7,784	6,813	5,777	3,922	1,811	354	150	67	134	199	316	35,083
Entire State:													
1908	5,796	7,984	12,019	11,201	9,777	5,241	1,900	515	449	606	1,147	2,103	58,738
1909	4,366	4,761	6,876	7,053	7,033	8,153	2,695	1,031	688	1,160	3,257	5,790	52,863
1910	9,726	10,047	13,770	9,931	10,490	6,837	2,474	883	452	722	1,593	2,953	69,878
1911	4,068	4,979	6,657	8,030	10,359	5,377	2,744	1,020	465	742	1,477	2,757	48,675
1912	4,831	6,426	10,721	11,342	11,284	7,522	3,684	1,156	575	1,203	2,485	4,070	65,299
1913	6,609	7,920	9,877	10,611	11,117	8,257	3,711	987	590	1,520	1,634	2,541	65,374
1914	4,366	5,258	6,989	7,892	8,876	6,447	2,873	1,123	533	671	1,057	1,798	47,883
1915	2,596	3,536	6,725	10,361	12,348	10,884	4,275	1,250	613	1,312	3,385	5,375	62,660
1916	6,412	7,344	10,189	11,761	11,997	9,573	5,112	1,073	345	397	975	1,832	67,110
1917	3,391	5,007	7,902	9,451	11,712	9,563	3,612	954	525	1,018	2,254	5,471	60,860
1918	7,767	8,570	13,662	14,834	14,407	7,661	4,814	1,329	456	586	430	353	74,869
1919	706	933	1,447	2,065	3,077	2,269	1,240	432	220	653	1,584	5,256	19,882
1920	10,928	11,231	10,758	10,535	11,013	9,054	4,130	1,190	507	1,213	3,190	4,732	78,481

SCARLET FEVER

Up-State:													
1908	675	697	917	638	778	467	72	240	439	708	952	884	7,467
1909	1,039	1,019	1,211	1,120	936	794	363	319	376	645	815	1,106	9,423
1910	1,421	1,884	1,782	1,421	1,327	882	445	296	277	584	889	1,012	12,220
1911	1,289	1,246	1,732	1,316	1,185	626	321	191	244	499	608	780	10,037
1912	803	806	912	791	627	368	223	144	199	298	287	405	5,863
1913	716	746	878	768	792	563	308	204	282	350	379	538	6,524
1914	717	749	987	834	780	565	324	363	355	509	643	665	7,491
1915	691	651	660	700	676	450	267	166	173	397	487	605	5,923
1916	627	556	619	644	579	414	229	118	152	295	465	570	5,268
1917	872	1,049	1,615	1,651	873	564	308	171	258	465	667	681	9,174
1918	759	632	771	770	547	326	235	195	249	348	344	462	5,638
1919	586	732	881	658	660	451	299	205	402	668	877	1,062	7,481
1920	982	808	892	782	773	605	340	237	303	587	966	1,374	8,649
New York City:													
1908	2,512	3,221	4,914	2,774	3,769	1,781	841	333	533	546	706	1,006	22,936
1909	1,657	1,498	1,964	1,355	1,317	1,096	861	289	378	505	1,147	1,437	13,004
1910	2,234	2,681	3,564	2,991	2,734	1,604	542	392	302	340	784	1,116	19,284
1911	1,795	2,593	2,395	2,433	2,858	1,187	453	302	209	383	665	785	16,058
1912	1,113	1,545	2,229	1,990	1,694	1,138	532	279	254	371	619	1,078	12,842
1913	1,505	1,437	1,852	1,526	1,245	747	355	232	253	313	488	786	10,739
1914	1,252	1,368	1,677	1,599	1,709	951	477	144	239	390	602	797	11,205
1915	1,094	1,201	1,592	1,731	1,392	987	409	179	147	232	395	520	9,879
1916	680	753	948	842	792	489	300	78	72	159	267	435	5,815

TABLE 2 — Concluded

IMPORTANT COMMUNICABLE DISEASES REPORTED BY MONTHS FOR UP-STATE, NEW YORK CITY AND ENTIRE STATE, 1908–1920 — *Concluded*

SCARLET FEVER — *Concluded*

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
New York City:— *Concluded*													
1917	578	657	622	775	872	515	267	105	178	345	527	619	6,060
1918	579	546	634	579	512	321	206	105	164	244	206	364	4,460
1919	510	553	676	579	554	280	146	81	144	239	295	537	4,594
1920	647	568	662	642	690	429	208	146	183	388	697	1,277	6,537
Entire State:													
1908	3,187	3,918	5,831	3,412	4,547	2,248	913	573	972	1,254	1,658	1,890	30,403
1909	2,696	2,517	3,175	2,475	2,253	1,890	724	608	754	1,150	1,962	2,543	22,747
1910	3,655	4,565	5,346	4,412	4,061	2,486	987	688	579	924	1,675	2,128	31,504
1911	3,084	3,839	4,127	3,749	4,043	1,813	774	493	453	882	1,273	1,565	26,095
1912	1,916	2,351	3,141	2,781	2,321	1,506	755	433	453	669	906	1,483	18,705
1913	2,221	2,183	2,730	2,294	2,037	1,310	663	436	535	663	867	1,324	17,263
1914	1,969	2,117	2,664	2,433	2,489	1,516	801	507	594	899	1,245	1,462	18,696
1915	1,785	1,852	2,252	2,431	2,068	1,437	676	345	320	629	882	1,125	15,802
1916	1,307	1,309	1,567	1,486	1,371	903	529	196	234	454	732	1,005	11,083
1917	1,450	1,706	2,237	2,426	1,745	1,079	575	276	436	810	1,194	1,300	15,234
1918	1,338	1,178	1,405	1,349	1,059	647	441	300	413	592	550	826	10,098
1919	1,096	1,285	1,557	1,237	1,214	731	445	286	546	907	1,172	1,599	12,075
1920	1,629	1,376	1,554	1,424	1,463	1,034	548	383	486	975	1,663	2,651	15,186

WHOOPING COUGH

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Up-State:													
1908	....	....	....	....	....	....	....	....	....	....	....	....	....
1909	....	....	....	....	....	....	....	....	....	....	....	....	....
1910	....	....	....	....	....	....	....	....	....	....	....	....	....
1911	399	331	514	471	539	495	414	341	234	261	568	549	5,116
1912	789	598	463	578	598	522	499	336	254	292	329	380	5,638
1913	462	395	416	321	382	482	408	597	300	359	608	790	5,520
1914	850	641	902	940	1,166	914	448	381	256	262	411	682	7,853
1915	587	602	612	469	444	486	596	467	277	578	657	792	6,567
1916	952	794	868	795	1,099	1,011	1,282	933	509	460	584	550	9,837
1917	676	790	860	1,164	1,248	1,163	1,565	1,025	833	1,147	1,223	1,064	12,758
1918	1,469	1,063	1,304	1,217	1,374	1,156	1,041	794	610	331	331	274	10,964
1919	222	255	241	159	308	311	571	518	444	680	996	910	5,615
1920	1,152	812	1,109	855	996	1,131	1,376	1,242	904	877	1,405	1,835	13,694

New York City:													
1908	......	......	......	......	......	......	......	......	......	......	......	......	......
1909	......	......	......	......	......	......	......	......	......	......	......	......	......
1910	......	......	......	......	......	......	......	......	......	......	......	......	......
1911	335	432	423	267	450	258	223	265	161	133	183	116	3,246
1912	187	173	246	200	327	231	201	136	114	113	129	126	2,183
1913	198	262	323	543	503	382	281	202	215	184	242	163	3,498
1914	220	258	275	489	387	393	318	374	286	336	253	229	3,818
1915	310	409	489	559	637	701	806	806	630	493	468	463	6,771
1916	465	526	930	1,094	1,140	1,033	968	755	246	121	97	85	7,460
1917	122	153	177	285	418	511	771	1,018	566	435	577	564	5,597
1918	824	786	812	800	675	491	482	298	151	101	80	58	5,558
1919	48	51	36	61	70	80	184	152	145	140	251	440	1,668
1920	816	816	1,076	702	624	675	699	664	534	297	298	333	7,534
Entire State:													
1908	......	......	......	......	......	......	......	......	......	......	......	......	......
1909	......	......	......	......	......	......	......	......	......	......	......	......	......
1910	......	......	......	......	......	......	......	......	......	......	......	......	......
1911	734	763	937	738	989	753	637	606	395	394	751	665	8,362
1912	976	771	709	778	925	753	700	472	368	405	458	506	7,821
1913	660	657	739	864	885	864	689	799	515	543	850	953	9,018
1914	1,070	899	1,177	1,429	1,553	1,307	766	755	542	598	664	911	11,671
1915	897	1,011	1,101	1,028	1,081	1,187	1,402	1,273	907	1,071	1,125	1,255	13,338
1916	1,417	1,320	1,798	1,889	2,239	2,044	2,250	1,688	755	581	681	635	17,297
1917	798	943	1,037	1,449	1,666	1,674	2,336	2,043	1,399	1,582	1,800	1,628	18,355
1918	2,293	1,849	2,116	2,017	2,049	1,647	1,523	1,092	761	432	411	332	16,522
1919	270	306	277	220	378	391	755	670	589	820	1,247	1,350	7,283
1920	1,968	1,628	2,181	1,557	1,620	1,806	2,075	1,906	1,438	1,174	1,703	2,168	21,224

Table 3

REPORTED CASES, DEATHS, CASE FATALITY RATE PER CENT, CASE AND DEATH RATES PER 100,000 POPULATION FOR CERTAIN COMMUNICABLE DISEASES BY COUNTIES

COUNTIES	Typhoid Fever					Measles					Scarlet Fever					Whooping Cough					Diphtheria				
	Cases	Deaths	Case fatality rate	Case rate	Death rate	Cases	Deaths	Case fatality rate	Case rate	Death rate	Cases	Deaths	Case fatality rate	Case rate	Death rate	Cases	Deaths	Case fatality rate	Case rate	Death rate	Cases	Deaths	Case fatality rate	Case rate	Death rate
Albany	65	6	9.2	85	3	1,509	13	.9	808	7	334	3	.9	179	2	592	11	1.9	317	6	223	22	9.9	119	12
Allegany	29	3	10.3	79	8	260	3	1.2	710	8	52	2	3.8	142	5	285	4	1.4	779	11	34	1	2.9	93	3
Broome	29	7	24.1	25	6	1,733	20	1.2	1,502	17	245	6	2.5	212	5	744	19	2.6	645	16	135	19	14.1	117	16
Cattaraugus	17	1	5.9	24	1	701	7	1.0	979	10	140	1	.7	196	1	254	13	5.1	355	18	159	14	8.8	222	20
Cayuga	29	10	34.5	45	15	495	5	1.0	760	8	107	1	.9	164	2	175	17	9.7	269	26	116	18	15.5	178	28
Chautauqua	40	7	17.5	35	6	1,063	5	.5	917	4	169	3	1.8	146	3	601	6	1.0	519	5	254	15	5.9	219	13
Chemung	22	3	13.6	33	5	1,036	4	.4	1,559	6	30	…	…	45	…	353	5	1.4	531	8	49	3	6.1	74	5
Chenango	8	…	…	23	…	42	…	…	120	…	41	…	…	117	…	84	2	2.4	240	6	47	4	8.5	135	11
Clinton	8	2	25.0	18	5	605	3	.5	1,385	7	123	4	3.3	282	9	91	2	2.2	208	5	45	3	6.7	103	7
Columbia	41	4	9.8	106	10	512	6	1.2	1,323	16	107	…	…	277	…	105	2	1.9	271	5	24	3	12.5	62	8
Cortland	10	2	20.0	34	7	91	1	1.1	307	3	194	1	.5	654	3	72	2	2.8	243	7	25	4	16.0	84	13
Delaware	14	1	7.1	33	2	411	…	…	964	…	55	3	5.5	129	7	52	4	7.7	122	9	40	…	…	94	…
Dutchess	24	2	8.3	26	2	492	4	.8	535	4	109	1	.9	119	1	314	21	6.7	341	23	83	5	6.0	90	5
Erie	163	30	18.4	25	5	6,387	69	1.1	998	11	874	29	3.3	137	5	1,830	50	2.7	286	8	3,644	330	9.1	569	52
Essex	9	1	11.1	28	3	293	5	1.7	922	16	75	2	2.7	236	6	18	…	…	57	…	39	…	…	123	…
Franklin	19	3	15.8	44	7	70	1	1.4	161	2	112	3	2.7	258	7	68	6	8.8	157	14	45	6	13.3	104	14
Fulton	12	3	25.0	27	7	113	3	2.7	251	7	38	3	7.9	85	7	39	4	10.3	87	9	8	2	25.0	18	4
Genesee	22	2	9.1	58	5	636	4	.6	1,674	11	106	5	4.7	279	13	101	1	1.0	266	3	49	3	6.1	129	8
Greene	25	1	4.0	98	4	383	3	.8	1,498	12	27	2	7.4	106	8	83	3	3.6	325	12	34	2	5.9	133	8
Hamilton	1	…	…	3	…	4	…	…	10	…	…	…	…	…	…	…	…	…	…	…	1	…	…	3	…
Herkimer	22	3	13.6	34	5	1,367	4	.3	2,090	6	129	2	1.6	197	3	243	6	2.5	372	9	55	5	9.1	84	8
Jefferson	42	9	21.4	51	11	84	2	2.4	102	2	285	13	4.6	346	16	478	10	2.1	580	12	74	9	12.2	90	11
Lewis	2	…	…	8	…	24	…	…	102	…	19	…	…	80	…	24	3	12.5	102	13	4	1	25.0	17	4
Livingston	15	2	13.3	41	5	430	2	.5	1,169	5	32	…	…	87	…	127	1	.8	345	3	52	4	7.7	141	11
Madison	11	1	9.1	28	3	77	1	1.3	195	3	127	3	2.4	321	8	68	…	…	172	…	30	1	3.3	76	3

Monroe	34	6	17.7	10	2	2,452	80	1.2	690	8	632	25	4.0	178	7	427	22	5.2	120	6	1,694	90	5.3	476	25
Montgomery	30	1	3.3	52	2	307	1	.3	530	2	65	1	1.5	112	2	214	3	1.4	360	5	96	6	6.3	166	10
Nassau	9	4	44.4	7	3	675	5	.7	526	4	200	1	.5	156	1	187	7	3.7	146	5	187	16	8.6	146	12
Niagara	63	7	11.1	52	6	1,821	21	1.2	1,517	17	572	9	1.6	476	7	728	18	2.5	606	15	337	32	9.5	281	27
Oneida	45	4	8.9	24	2	1,536	13	.9	833	7	255	4	1.6	138	2	268	14	5.2	145	8	271	34	12.6	147	18
Onondaga	104	8	7.7	43	3	2,401	22	.9	986	9	726	24	3.3	298	10	230	14	6.1	94	6	472	43	9.1	194	18
Ontario	19	2	10.5	36	4	537	4	.7	1,020	8	189	6	3.2	359	11	63	6	9.5	120	11	55	3	5.5	104	6
Orange	29	7	24.1	24	6	776	3	.4	646	2	346	2	.6	288	2	261	10	3.8	217	8	166	13	7.8	138	11
Orleans	6	2	33.3	21	7	163	3	1.8	573	11	37	....	....	130	....	59	2	3.4	207	7	14	2	14.3	49	7
Oswego	21	2	9.5	30	3	1,612	22	1.4	2,270	31	106	....	....	149	....	89	6	6.7	125	8	82	7	8.5	115	10
Otsego	17	1	5.9	37	2	146	....	....	316	....	104	3	2.9	225	7	76	1	1.3	165	2	88	6	6.8	191	13
Putnam	1	....	....	9	....	68	....	....	641	....	19	....	....	179	....	51	....	....	481	....	11	1	9.1	104	9
Rensselaer	37	5	13.5	33	4	635	4	.6	564	4	115	4	3.5	102	4	546	8	1.5	485	7	66	8	12.1	59	7
Rockland	5	2	40.0	11	4	655	3	.5	1,440	7	34	....	....	75	....	191	1	.5	420	2	104	9	8.7	229	20
St. Lawrence	86	7	8.1	98	8	345	2	.6	392	2	237	10	4.2	269	11	209	9	4.3	237	10	53	7	13.2	60	8
Saratoga	47	6	12.8	78	10	393	1	.3	656	2	170	20	11.8	284	33	227	8	3.5	379	13	46	1	2.2	77	2
Schenectady	106	8	7.6	96	7	1,470	10	.7	1,331	9	110	2	1.8	100	2	363	5	1.4	329	5	125	7	5.6	113	6
Schoharie	8	1	12.5	88	5	90	....	....	425	....	47	....	....	222	....	55	1	1.8	260	5	2	....	....	9	....
Schuyler	1	....	....	8	....	269	1	.4	2,061	8	17	....	....	130	....	23	....	....	176	....	....	....	....	....	....
Seneca	113	8	7.1	459	32	98	....	....	398	....	18	2	11.1	73	8	83	1	1.2	337	4	70	2	2.9	284	8
Steuben	17	2	11.8	21	2	254	1	.4	316	1	67	1	1.5	83	1	131	4	3.1	163	5	35	3	8.6	43	4
Suffolk	35	7	20.0	32	6	377	5	1.3	340	5	146	6	4.1	132	5	151	7	4.6	136	6	168	6	3.6	151	5
Sullivan	16	1	6.3	48	3	201	1	.5	607	3	49	....	....	148	....	85	....	....	257	....	65	6	9.2	196	18
Tioga	26	3	11.5	108	12	58	....	....	240	....	26	1	3.9	108	4	123	1	.8	510	4	53	6	11.3	220	25
Tompkins	10	1	10.0	28	3	57	....	....	161	....	56	....	....	158	....	131	4	3.1	370	11	18	....	....	51	....
Ulster	36	8	22.2	49	11	1,145	7	.6	1,545	9	119	2	1.7	161	3	192	5	2.6	259	7	66	13	19.7	89	18
Warren	2	4	....	6	13	13	....	....	41	....	12	1	8.3	38	3	35	1	2.9	111	3	9	1	11.1	28	3
Washington	14	....	....	31	....	199	1	.5	445	2	10	....	....	22	....	53	3	5.7	118	7	25	4	16.0	56	9
Wayne	13	3	23.1	27	6	1,000	4	.4	2,051	8	83	1	1.2	170	2	139	1	.7	285	2	103	....	....	211	....
Westchester	87	5	5.8	25	1	4,370	31	.7	1,257	9	519	12	2.3	149	3	1,318	33	2.5	379	9	831	56	6.7	239	16
Wyoming	2	2	100.0	7	7	358	2	.6	1,184	7	13	1	7.7	43	3	170	2	1.2	562	7	46	3	6.5	152	10
Yates	7	3	42.9	42	18	99	....	....	599	....	20	....	....	121	....	15	....	....	91	....	15	1	6.7	91	6
Up State	1,725	223	12.9	36	5	43398	362	.8	907	8	8,649	225	2.6	181	5	13694	389	2.8	286	8	10642	860	8.1	222	18
New York City	969	138	14.2	17	2	35083	736	2.1	619	13	6,537	220	3.4	115	4	7,530	615	8.2	133	11	14166	1,045	7.4	250	18
Grand total	2,694	361	13.4	26	3	78481	1,098	1.4	752	11	15186	445	2.9	145	4	21224	1,004	4.7	203	10	24808	1,905	7.7	238	18

Table 4

COMMUNICABLE DISEASES REPORTED BY COUNTIES, 1920

COUNTY	Typhoid fever	Measles	Scarlet fever	Whooping cough	Diphtheria	Smallpox	Tuberculosis: Pulmonary	Tuberculosis: Other forms	Tuberculosis: Total	Cerebrospinal meningitis	Chickenpox	German measles	Mumps	Puerperal septicemia
Albany	65	1,509	334	592	223	4	352	43	395	8	276	20	262	2
Allegany	29	260	52	285	34	......	22	4	26	1	119	7	19	1
Broome	29	1,733	245	744	135	......	137	14	151	1	379	9	60	8
Cattaraugus	17	701	140	254	159	3	68	4	72	......	98	8	69	......
Cayuga	29	495	107	175	116	1	36	1	37	3	74	13	143	......
Chautauqua	40	1,063	169	601	254	1	133	25	158	2	347	19	394	1
Chemung	22	1,036	30	353	49	37	78	9	87	3	213	2	30	2
Chenango	8	42	41	84	47	......	25	2	27	......	47	......	21	1
Clinton	8	605	123	91	45	......	47	7	54	......	31	......	33	......
Columbia	41	512	107	105	24	......	55	6	61	......	26	4	3	......
Cortland	10	91	194	72	25	2	35	5	40	......	46	1	11	......
Delaware	14	411	55	52	40	2	34	3	37	......	43	8	60	1
Dutchess	24	492	109	314	83	......	147	10	157	1	387	12	213	......
Erie	163	6,387	874	1,830	3,644	72	1,015	163	1,178	23	1,218	8	939	18
Essex	9	293	75	18	39	1	102	6	108	......	32	1	53	......
Franklin	19	70	112	68	45	40	1,333	70	1,403	......	42	1	11	......
Fulton	12	113	38	39	8	......	41	3	44	2	28	......	69	......
Genesee	22	636	106	101	49	8	40	4	44	1	89	4	33	1
Greene	25	383	27	83	34	......	63	2	65	2	29	2	5	......
Hamilton	1	4	......	......	1	......	2	......	2	......	25	......	9	......
Herkimer	22	1,367	129	243	55	6	128	14	142	......	87	5	115	1
Jefferson	42	84	285	478	74	2	85	6	91	1	165	4	98	3
Lewis	2	24	19	24	4	7	25	......	25	......	29	1	16	1
Livingston	15	430	32	127	52	1	24	3	27	......	58	11	37	......
Madison	11	77	127	68	30	......	51	1	52	......	63	5	86	1
Monroe	34	2,452	632	427	1,694	29	744	15	759	3	445	2	145	4
Montgomery	30	307	65	214	96	......	83	15	98	1	133	2	135	......
Nassau	9	675	200	187	187	......	108	18	126	3	164	26	170	......
Niagara	63	1,821	572	728	337	21	209	33	242	2	645	3	65	1
Oneida	45	1,536	255	268	271	7	236	23	259	3	448	13	550	......
Onondaga	104	2,401	726	230	472	3	297	13	310	1	225	6	115	1
Ontario	19	537	189	63	55	1	80	7	87	2	152	10	88	1
Orange	29	776	346	261	166	9	205	20	225	7	274	11	311	2
Orleans	6	163	37	59	14	......	32	......	32	1	53	2	5	......
Oswego	21	1,612	106	89	82	......	95	4	99	......	59	1	7	......

Otsego	17	146	104	76	88	1	36	4	40	2	110	......	12	......
Putnam	1	68	19	51	11	......	23	2	25	......	16	5	16	......
Rensselaer	37	635	115	546	66	......	203	18	221	1	210	6	38	......
Rockland	5	655	34	191	104	......	91	11	102	......	33	37	82	1
St. Lawrence	86	345	237	209	53	8	109	10	119	2	102	4	86	2
Saratoga	47	393	170	227	46	1	137	8	145	......	118	5	69	......
Schenectady	106	1,470	110	363	125	......	151	22	173	1	102	2	154	......
Schoharie	8	90	47	55	2	......	22	2	24	......	21	1	6	1
Schuyler	1	269	17	23	......	......	20	2	22	......	24	1	6	......
Seneca	113	98	18	83	70	......	24	2	26	2	58	2	88	......
Steuben	17	254	67	131	35	3	96	9	105	3	193	7	24	1
Suffolk	35	377	146	151	168	......	99	12	111	1	123	11	276	1
Sullivan	16	201	49	85	65	......	858	81	939	......	63	13	10	......
Tioga	26	58	26	123	53	......	18	2	20	1	13	1	30	......
Tompkins	10	57	56	131	18	7	49	11	60	2	53	3	32	......
Ulster	36	1,145	119	192	66	1	188	13	201	2	144	4	291	......
Warren	2	13	12	35	9	......	87	4	91	......	28	1	71	......
Washington	14	199	10	53	25	1	52	6	58	1	116	1	196	1
Wayne	13	1,000	83	139	103	......	48	7	55	1	74	1	24	2
Westchester	87	4,370	519	1,318	831	2	432	35	467	16	1,002	171	463	8
Wyoming	2	358	13	170	46	......	22	4	26	......	33	2	26	......
Yates	7	99	20	15	15	......	8	3	11	1	5	2	1	......
Up-State	1,725	43,398	8,649	13,694	10,642	281	8,940	821	9,761	107	9,190	501	6,371	67
New York City	969	35,083	6,537	7,530	14,166	24	14,035	......	14,035	244	5,534	1,011	3,359	95
Grand total	2,694	78,481	15,186	21,224	24,808	305	22,975	821	23,796	351	14,724	1,512	9,730	162

Table 4 — Concluded

COMMUNICABLE DISEASES REPORTED BY COUNTIES, 1920 — *Concluded*

COUNTY	Poliomyelitis	Paratyphoid	Septic sore throat	Ophthalmia neonatorum	Dysentery	Lobar pneumonia	Bronchopneumonia	Trachoma	Influenza	Anthrax	Rabies	Typhus	Tetanus	Encephalitis lethargica
Albany	1	2	20	2	1	418	365	1	3,178	......	......	......	......	2
Allegany	......	......	2	......	......	105	86	......	993	......	......	......	......	......
Broome	1	9	13	2	......	507	126	......	1,974	11	......	......	2	......
Cattaraugus	......	1	1	2	......	112	111	1	1,025	......	......	......	......	......
Cayuga	......	......	9	1	......	171	51	......	612	......	......	......	1	1
Chautauqua	2	1	13	......	......	361	96	......	2,868	......	......	......	......	......
Chemung	2	......	......	......	......	78	82	......	60	......	......	......	1	2
Chenango	......	......	......	......	......	63	42	......	1,015	......	......	......	1	......
Clinton	......	......	3	1	......	39	23	......	400	......	......	......	1	......
Columbia	3	1	......	......	......	40	49	......	364	......	......	......	1	......
Cortland	......	......	......	1	......	72	42	......	375	......	......	......	......	......
Delaware	1	......	2	......	......	93	45	......	1,238	......	......	......	1	......
Dutchess	2	......	1	2	......	179	124	3	1,308	......	......	......	1	4
Erie	5	......	9	12	4	1,165	1,228	2	6,190	1	......	......	3	7
Essex	......	2	2	......	......	28	39	......	340	......	......	......	......	1
Franklin	......	......	......	......	......	63	64	......	242	......	......	......	......	......
Fulton	......	......	......	1	......	63	70	......	207	4	......	......	......	......
Genesee	......	......	3	......	......	32	64	......	323	......	......	......	......	1
Greene	......	......	......	......	......	21	29	......	390	......	......	......	......	......
Hamilton	......	......	......	......	......	27	4	......	96	......	......	......	......	......
Herkimer	1	......	1	1	1	116	71	......	1,054	......	......	......	1	1
Jefferson	1	......	4	1	......	102	103	......	1,132	......	......	......	......	......
Lewis	......	......	......	......	......	41	30	......	506	......	......	......	......	......
Livingston	......	......	......	......	......	43	53	......	361	......	......	......	......	......
Madison	1	......	2	1	......	40	31	......	277	......	......	......	......	......
Monroe	2	......	2	3	2	644	108	3	2,159	1	......	......	......	1
Montgomery	......	......	93	......	3	118	42	3	1,911	1	......	......	2	1
Nassau	2	......	8	1	1	144	131	31	861	1	......	......	......	......
Niagara	4	......	2	......	......	197	263	......	2,594	......	......	......	......	1
Oneida	1	1	1	4	1	401	215	......	2,007	......	......	......	3	2
Onondaga	2	......	7	......	7	240	372	1	1,053	......	......	......	......	......
Ontario	1	......	......	......	1	118	68	......	1,070	......	......	......	......	......
Orange	3	2	4	1	46	184	174	......	1,213	......	......	......	3	5
Orleans	......	......	6	......	1	24	17	......	231	......	......	......	......	......
Oswego	1	......	4	......	2	120	103	......	102	......	......	......	2	2
Otsego	......	1	3	......	......	68	43	......	832	......	1	......	......	......
Putnam	1	......	2	......	......	18	28	......	406	......	......	......	......	......

Rensselaer	3	......	5	3	......	146	254	......	603	......	......	......	4	......
Rockland	1	1	......	......	......	89	53	......	422	......	......	......	1	2
St. Lawrence	1	......	1	......	4	171	194	1	1,457	1	......	......	2	......
Saratoga	......	3	2	1	......	142	155	2	1,986	......	......	......	......	2
Schenectady	1	......	3	1	......	97	160	......	259	......	......	......	1	1
Schoharie	......	......	4	......	......	16	31	......	572	......	......	......	......	......
Schuyler	......	......	......	......	......	15	5	......	28	......	......	......	......	1
Seneca	......	......	......	......	3	67	77	......	554	......	......	......	......	1
Steuben	......	......	7	......	......	102	81	......	1,102	1	......	......	1	......
Suffolk	2	......	2	......	......	145	194	......	2,505	......	......	......	2	2
Sullivan	1	......	6	......	......	37	53	......	249	......	......	......	......	......
Tioga	......	......	26	......	......	27	42	......	398	1	......	......	......	......
Tompkins	1	......	2	1	......	84	33	......	949	......	......	......	1	1
Ulster	2	......	......	......	......	180	89	......	1,276	......	......	......	......	1
Warren	......	......	......	......	2	47	30	......	224	......	......	......	2	1
Washington	......	......	1	1	......	41	46	......	246	......	......	......	1	......
Wayne	2	2	11	......	3	58	68	......	1,188	......	......	......	2	1
Westchester	8	......	28	2	9	826	466	2	2,662	......	......	......	2	7
Wyoming	1	......	4	......	......	67	42	......	954	......	......	......	......	......
Yates	......	......	......	......	......	20	9	......	166	......	......	......	......	......
Up-State	60	26	319	45	91	8,627	6,674	50	58,767	22	1	......	40	51
New York City	154	11	......	19	......	26,083	......	......	69,824	25	1	8	21	48
Grand total	214	37	319	64	91	34,710	6,674	50	128,591	47	2	8	61	99

DIVISION OF VENEREAL DISEASES

DIVISION OF VENEREAL DISEASES

Hermann M. Biggs, M. D., *Commissioner of Health, Albany, N. Y.:*

Sir.—As Director of the Division of Venereal Diseases, I have the honor to submit the following report of the activities of this Division for the year 1920.

Very respectfully

JOSEPH S. LAWRENCE

Director

A. A. Surgeon

FOREWORD

The Division of Venereal Diseases with the close of 1920 completes two and one-half years' work, and the following pages are devoted to a brief review of its activities during that period.

A comparison of this report with previous-statements by the Division will show a marked increase in the number of patients treated at the clinics and in the number of treatments administered. It will show a decrease in the number of pamphlets distributed and a decrease in the attendance at lectures, but an increase in the number of groups addressed. The decreases are natural and may be charged in part to the change in public conditions. Our audiences were larger in 1919 owing to the psychology of the times, for it was then that the Federal Government was arousing interest in the venereal diseases by its frequent reports of incapacitated or rejected draftees; also the manner of presenting the discussion of venereal diseases was new and curiosity attracted many people to attend the lectures. The distribution of literature largely depended upon the attendance at these lectures. The report also deals with the organization of community work and an early attempt at its evaluation.

INTRODUCTION

On January 1, 1920, this Division entered upon the latter half of the second year of its activities. With its scope of work markedly broadened and its staff grown rapidly in numbers, the bureau was designated as a division and the title of the chief was changed to director.

The original objectives were to interest the lay public in the serious nature of the venereal diseases, their prevalence (the extent of which was only surmised even by members of the staff), and their influence upon the economic life of the community; to spread broadcast the hope of relief offered by scientific treatment; to stimulate the medical profession to make use of the laboratory when diagnosing a venereal disease; and to employ more generally the latest methods of treatment, particularly the administration of arsphenamine in the treatment of syphilis; and to develop extra-clinic service that would retain the interest of the patient for a satisfactory therapeutic period.

In our efforts to interest the lay public, lectures by skilled physicians, both male and female, were widely employed. To add to the effectiveness of the lectures, films, lantern slides, and panel exhibits were used to illustrate specific points. At the organization of the work five pamphlets were prepared and distributed. These pamphlets described the venereal diseases, their communicability, diagnosis and treatment and were addressed to different groups of the public. During the year 1920, additional pamphlets were prepared. One aimed to instruct the public in the normal physiological conditions and functions of the generative organs; others directed to individuals and groups emphasized more specifically the methods of avoiding infection and those calculated to diminish the spread of the disease. The field of activities was extended from the cities and factory vicinities into the rural districts. Efforts to stimulate the medical profession were concentrated in addresses to medical societies and in the distribution of a selected number of case histories reprinted from those published by Richard Cabot of the Massachusetts General Hospital.

To demonstrate the efficiency of the newer scientific methods of treatment and to remove from the community the infected indigents whose capacity for spreading disease is very generally known, public clinics or dispensaries (to be known hereafter as clinics) were established in all of the large cities where health authorities had not already done so. The development of these clinics emphasized the essential need of extensive and effective methods of continuing the interest of the patient in securing a cure, which of necessity requires the long continuance of the patient's visits to the clinics for treatment and observation. The reports from most of the clinics showed that the physician and nurse in the clinic needed extra-clinic assistance to maintain the interest of the patient in his cure and as an experiment the Division attempted to supply this need by the employment of social workers (more correctly named community workers) to extend the contact of the clinic to the patient's home.

Family investigation was a direct result of this extra-clinic work. Nurses were attached to one of the state hospitals to make investigations of the families of the syphilitic insane inmates and when possible to secure medical examination of the immediate relatives. Results of this investigational work were so encouraging that an offer of assistance in making examinations of their inmates was extended to the orphanages of the State. Later an investigation was undertaken of the relatives of those children whose blood examination indicated possibility of congenital syphilis. This line of work will admit of much further development in the future.

Our success in realizing these ambitions will be described more in detail in the following pages.

Financial Statement

Funds Available for Venereal Disease Work in New York State, 1918–1921

	State	Federal
July 1, 1918 — June 30, 1919	$30,000	$99,090 89
July 1, 1919 — June 30, 1920	45,000	107,794 18
Laboratory	55,000	....
July 1, 1920 — June 30, 1921	46,790	54,137 84
Laboratory	48,500	....
Total	$225,290	$261,022 91

The activities of the Division have been directed along four principal lines and the budgets have been divided to meet their demands. The allotments were made in such proportion as it was estimated they would be needed. For treatment of indigents and subsidizing communities in their efforts to establish treatment centers fifty per cent of the funds have been set aside. For educational and repressive purposes respectively, twenty per cent was devoted, while approximately ten per cent was expended in organizing and administering the work.

A close adherence to this arbitrary division was not thought advisable as regards the amounts for education and repression. It was apparent that there was considerable need for the education of the public on the serious problem presented by the venereal diseases before any active cooperation could be expected of them and certainly before they would appreciate the importance of inaugurating and enforcing adequate repressive measures. Probably in the near future it may be found expedient to reverse this inequality.

The full extent of the benefit derived by the State from these budgets is difficult to determine but when it is noted that more than 2,000,000 educational pamphlets have been distributed, more than 125,000 treatments have been given and almost 100,000 individuals examined by the intricate laboratory method, all for less than one-half the annual expense to the State for taking care of the syphilitic insane which, after all, are but a small portion of those infected with syphilis, sufficient justification for rapid development of the work is apparent. When the State is considering its constitutional obligation to the citizen of insuring to him "life, liberty, and the pursuit of happiness," it is well to know that during the year of 1920 among the known causes of sickness recorded by the Division of Vital Statistics syphilis ranked fourth, being preceded only by epidemic influenza, measles and pneumonia. As a cause of death, if to those deaths reported directly as due to syphilis there be added deaths due to those other well known syphilitic diseases, locomotor ataxia, general paresis and cerebrospinal syphilis, it ranks fifth, being surpassed only by such worthy competitors as pneumonia, tuberculosis, influenza and diphtheria.

	Cases	Rate	Deaths	Rate
Influenza	127,666	1221.6	5,852	56.0
Measles	78,473	750.9	1,098	10.5
Pneumonia	41,378	395.9	16,435	157.3
Syphilis	28,195	269.8	1,717	16.4
Diphtheria	24,807	237.4	1,905	18.2
Tuberculosis	24,081	230.4	12,475	119.4

The epidemic of influenza of 1918–1919 reappeared in a mild form in a few sections of New York State in 1920. It is probable that in another year influenza will drop back more nearly to the position it held prior to 1918.

Educational

Staff: Dr. Albert J. Read, Dr. Arthur R. Guerard, Dr. Carro C. Croff, Dr. Mary N. Sloan, Mrs. Milo M. Acker.

If all men and women could be profoundly impressed with the facts known to the medical profession regarding the disastrous effect upon life and health

exercised by the venereal diseases they would unite in one great movement to free themselves. There is no other group of diseases that so thoroughly demands universal attention for its control. No civilized people have escaped their withering touch and no family, howsoever well guarded by position and influence, but is liable to invasion. These are not diseases which attack the weak and exhausted and help bring a long life to a close but the strong and robust are their readiest victims and in their destruction of the unborn and cradled infant they occupy the unenvied distinction of being without a rival. Their power of injury and record of devastation known in part by all students of life and social customs have never been exposed to the public as they deserve because of the question of morality involved with one of the methods of propagation. The time is now opportune for those who know the menace syphilis and gonorrhea are to our nation to take the public into their confidence and together devise constructive measures for their eradication.

The government's policy of instructing the soldier has created a demand among the civilians for similar information. It has been the aim of this Division to stimulate intelligently this demand by responding to all requests for information with a plain statement of facts as they are known at present.

Our earlier efforts took the form of responding to spontaneous requests that arose from communities and organizations in different parts of the State by sending well qualified lecturers who in their addresses before the groups, confirmed the government reports and outlined methods of attack which included careful study of the nature of the diseases and their communicability. As the government work grew more extensive we volunteered our assistance by detailing certain members of our staff to assist in the instruction of draftees prior to the time of their being called to the army. In the second year of our work, the war having ended and demobilization begun, we concentrated our efforts more particularly on industrial centers. An elaborate program was worked out in an endeavor to bring our message to a large proportion of the industrial population of the State.

Our program for education in an industrial center was framed in the following manner: The interest of the health officer of the community was secured and following this, prominent individuals both men and women, were interviewed and invited to attend a luncheon where plans for a campaign were developed and their cooperation and interest secured. A week preceding the lecturing campaign an advance agent was sent into the community, who by means of posters and newspaper announcements as well as personal interviews, endeavored to interest the public in a series of lectures to be given later. Automatic machines for showing lantern slides were set up in busy sections of the city where they could silently tell their story of the horrors of syphilis and gonorrhea, and invite the public to attend the lectures to be given the following week at which more specific instruction would be given concerning the essential facts in discovering and controlling their ravages. The advertising agent was also an organizer and negotiated with the proprietors of the largest industries for an opportunity for the lecturers to give short talks to their employees at convenient times. These talks were usually fifteen minutes to half an hour in length and were always so framed as to stimulate the interest of the audiences to come to a general mass meeting to be held at the end of the lecturing period, which was usually a week. The largest hall available was secured for the mass meetings which were generally held in duplicate — one for the women and another for the men. Most often they were held in the same hall on successive nights. The lecturing staff detailed to a particular piece of work depended upon the size of the community, but there was always a lecturer of each sex so that the audiences might be segregated according to sex and the message made more direct. The program for the mass meetings consisted of a lecture, half an hour to an hour in length, followed by the showing of a film. At the women's meetings the film "The End of the Road" was usually used, while for the men, the film "Fit to Fight" was most often used in the early work, but after the close of the war this film was replaced by diagrammatic films which demonstrated by animated cartoon the progress and development of the diseases in the inoculated individual.

This program, decidedly more intense and instructive than our earlier work, still savors of propagandism because too little opportunity is given to discuss the problems with the individual and thus the information conveyed may or may not be assimilated by the hearers. Our program in this respect we considered weak and at the beginning of 1920 an effort was made to give our educational work more permanency. For this purpose a double conference was called of the leaders of all boys' and girls' organizations in the State to meet in Albany, January 14 and 15, for the purpose of laying plans for the inauguration of real educational work among the youth of the State. The Y. W. C. A. had shown by its activities in the preceding year that a program of this kind would be acceptable to most organizations and promised a great deal by its more or less permanency. The following organizations were represented at the conferences:

Military Training Commission.
Boy Scouts.
Girl Scouts.
Camp Fire Girls.
Young Men's Christian Association.
Young Women's Christian Association
Catholic Big Sisters.
Catholic Protective Society.
Young Men's Hebrew Association.
U. S. Public Health Service.
American Red Cross.
Children's Aid Society.
State Federation of Home Bureaus.
American Social Hygiene Association.
New York State Federation of Women's Clubs.
League of Women Voters.
State Congress of Mothers and Parent-Teachers.
Association of College Alumnae.
Women's Christian Temperance Union.
State Education Department.
The Home and Women's Club of Albany.
Albany City Club.
Troy Boys' Club.
Albany Boys' Club.
Girls' Friendly Society, Albany.
Postal Telegraph Company.
Utica City Educational Department.
Troy City Educational Department.
Albany City Educational Department.

The conference for leaders of boys' organizations was held on January 14. Addresses on the following subjects served as a program to introduce the discussions: "The Rural Boy," "The High School Boy," "The Boy in Industry," "The College Boy."

At the close of the day the men by vote agreed to carry back to their organizations the gist of the meeting and promised the cooperation of their clubs.

On January 15, representatives of the girls' organizations of the State convened under the same auspices and the following program served to introduce their discussions: "The Rural Girl," "The High School Girl," "The Girl in Industry," "The Club Girl."

At the meetings a free discussion of the needs of the youth of New York State, and the methods of education best suited to the prevention of venereal diseases was invited. Exhibits were made of the material available through the Department of Health as aids in giving such instruction.

As a result of the conference, the representatives of the various organizations agreed to act as chairmen of committees to secure the cooperation of their respective organizations with the proposed activities of the U. S. Public Health Service and the New York State Department of Health, and to aid in every way possible to bring to the youth of the State the needed instruction on venereal disease prevention. The material assistance rendered by them during the year has been encouraging and has resulted in bringing this instruction to thousands who would have otherwise been reached only with difficulty if at all.

Following the conferences our educational staff took up the work in the field, calling for the cooperation of the various organizations in twelve large cities and fourteen counties. The program adopted for this work follows:

Objects:

1. To disseminate information concerning the causes, nature, prevalence, cure and prevention of venereal diseases.

2. To call attention to the existence and location of established clinics and to urge their use by all in need.

3. To urge the necessity of laboratory tests, skillful medical examination and treatment for all exposed and infected individuals.

4. To demonstrate some of the educational activities which communities may carry on in the prevention of venereal diseases.

5. To awaken public interest in the prevention of venereal diseases.

Methods of Conducting Campaign:

A call was made on the health officer and sanitary supervisor of the district to determine the desirability of such activity. With their approval a committee of prominent citizens was organized to advise and assist in carrying out the details of the campaign. This committee, consisting of twenty or more prominent citizens, was divided into subcommittees on the following plan:

Committee on program
Committee on exhibits
Committee on mass meetings
Committee on ways and means
Committee on talks to employed groups
Committee on press and public information

A meeting of the committee was called as early as possible, frequently at some luncheon hour, when the program was outlined by the chief lecturer and the duties of the subcommittee defined. The committee on program assisted in determining the number and places for lectures; the committee on exhibits assisted in placing the automatic lantern slide machines and card exhibits in places of advantage; the committee on mass meetings helped secure the buildings or halls large enough to hold the audiences, employed the moving picture operator and arranged for advertising the meetings; the committee on ways and means assisted in securing what extra funds were necessary for employing a moving picture machine and operator, paying rent for the hall and such extra advertisement as was thought necessary, also providing transportation for the lecturers as they moved from place to place to meet the audiences; the committee on talks to employed groups assisted in completing arrangements for the lecturers to be admitted to all of the larger industries, department stores, etc., for a 15 or 20 minute talk; and the committee on press and public information made provision so that the meetings were properly reported in the news columns. While the committees were very helpful in their several ways, their greatest assistance lay in the moral support they gave.

During the week or two that the campaign in any community was in progress the work usually became so popular that the lecturers were invited by every group and organization to bring their message to them. The industrial talks were arranged for the noon hour when possible, but when there were not sufficient noon hours many employers were willing that time be allowed during working hours. All employers cheerfully displayed in various parts of their factories or mills announcements of the mass meetings and permanently placed our posters in the toilets and rest rooms of their factories. The culmination of the campaign was the mass meetings for which invariably the largest building available was too small. Not infrequently it was said that rarely had such large crowds come out for a meeting and especially for a health lecture.

Campaigns were carried on successfully in the following cities: Utica, Schenectady, Ilion, Herkimer, Binghamton, Johnson City, Endicott, Waverly, Elmira, Hornell, Corning, Ithaca, Port Chester and Batavia.

Educational Activities

HOME BUREAU. Our earliest educational work was essentially urban because the requests for lectures were entirely from city organizations. City conditions, including red-light districts, overcrowded houses and proximity of the sexes in

factories and large office buildings, were particularly thought to foster the propagation of venereal diseases and therefore ought to be the principal points of attack for our educational work. At our "Keeping Fit" conferences, however, it was developed that the rural boy and girl are not so fortunately situated as might be thought but that irregularities in sex life are sufficiently common outside of the cities to demand a greater share of our attention. Then, too, it was emphasized that the city was recruited from the country. A representative of the Home Bureau organization was present at the Keeping Fit Conference and requested cooperation with that organization in its rural work. It was explained that the Home Bureau Association is composed of the women of the farms and rural villages. They are grouped according to counties and each county organization, in addition to having an executive committee, employs a secretary whose responsibility is to assist the women in their social, civic and economic education. For years the men have had a similar organization called the Farm Bureau. It was agreed by the Division that it would cooperate with any of the secretaries in bringing to the women of her community the message we were carrying to the cities. Our cooperation has been most fruitful and pleasant. The secretary on her part chose the places for the lectures and advertised them and provided transportation for the lecturers between meetings. The Division on its part provided the lecturers and the literature. The accepted program has been for the secretary to arrange a series of six or more meetings to be held in one week but occasionally it has been found advisable to continue the work in the same county for two weeks.

Campaigns were carried on in the following counties under the auspices of the Home Bureau agencies: Oneida, Oswego, Orleans, Tompkins, Cattaraugus, Broome, Steuben, Otsego, Tioga, Chenango, Cortland, Lewis, Saratoga, Jefferson, Wayne, Clinton, St. Lawrence, Delaware, Ulster, Monroe and Erie. Mass meetings were addressed in the following places independent of any campaign program: Saranac Lake, Malone, Saratoga Springs, Cohoes, Canajoharie, Bath, Owego. Isolated smaller groups were addressed in many other towns and cities in response to requests by local citizens and organizations.

COUNTY AND STATE AGRICULTURAL FAIRS. During the year a special effort was made to place posters in all of the county fairs and the state fair. In response to letters addressed to the secretaries of the county fairs of the State, over thirty were provided with suitable posters which were placed in conspicuous positions in the fair buildings and rest rooms.

HEALTH WEEKS. "Keeping Fit" campaigns were also carried on in connection with Health Week programs at Hoosick Falls and Granville. In both instances the "Keeping Fit" exhibits and lectures conducted by the venereal disease division attracted a very large attendance and were pronounced by the committee in charge as contributing materially to the success and popularity of the week's program.

CONFERENCES ON BOYS' WORK. In response to numerous requests from Y. M. C. A., State Boys' Work Secretaries, five conferences were held in different parts of the State with representative leaders of boys' work throughout the State.

Object. The object of these conferences was to call the attention of the boy leaders of the State to the necessity of conserving the health and of safeguarding the morals of the boys of their constituencies; to call attention to the best methods of inculcating the essentials of healthful living and moral behavior; to enlist their individual interest in bringing before the boy leaders of the State the need of systematic, progressive health instruction for boys which would ultimately prevent a large number of the casualties due to misconduct and contracting the venereal diseases.

Such conferences were held in Buffalo, New York City, Albany, Syracuse and Brooklyn and were attended by representatives of the Y. M. C. A., Boy Scouts, Knights of Columbus, day school teachers and Sunday School teachers.

Results: The activity seeks to inaugurate a permanent work for the conservation of the health and the social ideals of the growing boys. It has been found very difficult to develop concerted and coordinated action on the part of the boy leaders in the various organizations in spite of the fact that many expressions have been received from them as to their determination to carry on this type of work.

As a result of these conferences the division has had an opportunity of placing "Keeping Fit" exhibits in a number of boys' organization rooms. These exhibits have been commented upon by the leaders as materially valuable to the boys of their constituencies. The demand for this instruction and exhibit material is increasing. Conferences have been held with boy leaders in the following cities for the purpose of organizing local activities along the plans outlined in the regional conferences: Yonkers, Auburn, Buffalo, Glens Falls, Binghamton, Troy and Ithaca.

CONVENTIONS. During the year, speakers have been supplied for the following important conventions: Dairymen and Health Officers' Conferences, Hotel Pennsylvania, New York City; New York Pharmaceutical Association, Thousand Island House, Thousand Islands; New York State American Legion, Albany; All-American Conference on Social Hygiene, Washington, D. C.; Conference of Charities and Corrections, Hotel Lafayette, Buffalo; Health Officers' Conference, Saratoga; New York State Federation of Labor, Binghamton; Brooklyn Red Cross Nurses' Conference, Brooklyn, N. Y. In some of these conventions both exhibits and speakers were provided and the exhibits proved a very great attraction.

ROTARY CLUBS. The following Rotary Clubs have been addressed during the year in regard to some phase of the work of this division: Utica, Schenectady, Binghamton, Waverly, Auburn, Elmira, Ithaca and Corning.

KIWANIS CLUBS. Kiwanis Clubs were similarly addressed in Schenectady, Binghamton and Auburn.

MILITARY TRAINING CADETS. Among those attending the Keeping Fit Conference were representatives of the Military Training Cadets. This organization is the product of a State law which makes it obligatory for every boy of the State between the ages of 16 and 18 years to present himself at an armory or other designated hall once a week for a prescribed course of training. It was explained at the Keeping Fit conference that lecturers would be welcome to address these boys. This was recognized as an unusual opportunity to reach an exceptionally large number of young men at the most impressionable age when venereal disease preventive instruction would have its greatest value.

In conference with the leaders of the Cadets and representatives of the American Social Hygiene Association and the Red Cross it was decided to take up the work conjointly. During the year members of the staff lectured before Cadet groups at the following places:

Utica	Johnson City	Cohoes
Whitesboro	Endicott	Port Chester
New York Mills.	Elmira	New York City
Clinton	Middletown	Brooklyn
Washington Mills	Troy	Hempstead
Ilion	Waverly	Mineola
Herkimer	Cornell	Freeport
Watertown	Corning	Jamaica
Schenectady	Ithaca	Staten Island
Binghamton	Batavia	

Specific instruction on the cause, nature, prevention and cure of venereal diseases was brought through this organization to over 8,000 boys 16 to 18 years of age in the State of New York.

During the year more than 800 lectures or addresses before audiences totaling 125,000 people have been given by different members of the staff. Of

this number, the educational staff alone delivered 774 before audiences totaling:

	Lectures	Audiences
Dr. Read	194	42,861
Dr. Guerard	114	18,119
Dr. Croff	208	26,876
Dr. Sloan	143	31,042
Mrs. Acker	115	5,020
Total	774	123,918

Mrs. Acker's work was entirely among rural groups mostly in cooperation with the Home Bureau. Dr. Read and Dr. Guerard worked almost entirely among industrial groups. Dr. Croff and Dr. Sloan divided their time between the two groups.

Attendance at lectures and comparison with figures of 1919 may be shown in the following table:

	1919	1920
Total number of lectures	558	800
Men and boys in industry	42,073	54,253
Training Commission Cadets	......	8,000
Women and girls in industry	25,391	24,099
Public mass meetings	67,163	20,560
Rural or Home Bureau meetings	......	8,902
Miscellaneous	......	9,731
Total	134,627	125,545

EDUCATIONAL EQUIPMENT. During the year material additions have been made to the educational equipment of the Division. A dozen very fine sepia photographs size three feet by six feet of selected work of ancient art have been procured to be used in constructing a background and setting for the panel exhibit. They have added greatly to the value of our exhibits when used in health weeks, conventions and similar gatherings. A large number of lantern slides has also been added to the equipment so that at present the Division has a collection of over one thousand different slides, besides duplicate sets of some of the more popular ones. Our slide assortment embraces:

A general lecture set for the adult public to be used by health officers and sanitary supervisors.

A set of "Keeping Fit" to be used in the attractoscope and also for the purpose of giving lectures on sex hygiene and venereal disease prevention.

A set of slides on sex hygiene for boys.

A set of slides on sex hygiene for girls.

A set of slides on the treatment of venereal diseases, popularly called the "Bill and Joe" set.

A set of slides from the film "How Life Begins."

Numerous miscellaneous legends and slides on venereal diseases in general for making up lecture sets.

EXHIBITS. A new set of exhibit panels for girls has been added to the equipment, so that we have now available in the department:

Sets of exhibit panels for the adult public.

Sets of exhibit panels on "Keeping Fit" for boys and young men.

Sets of exhibit panels for girls.

Sets of exhibit panels for display in clinics on treatment which are being loaned out to organizations interested in advancing this instruction.

FILMS. There has also been added a five-reel feature moving picture film "The End of the Road," a two-reel lecture film for men on "The Venereal Menace," a two-reel film for women on "Venereal Diseases," and a two-reel film on "The Treatment of Gonorrhea."

BRIEF DESCRIPTION OF MATERIAL USED IN EDUCATIONAL CAMPAIGN FILMS

FIT TO FIGHT (later revised and renamed FIT TO WIN). This film is a five reel feature and primarily an army film, but teaches a very practical lesson in regard to modes of contracting venereal diseases and the wisdom of a continent life for soldiers and single men.

The story centers about some young men who have just enlisted in the army and reported to camp. The usual invitation to see the sights of the town adjoining the camp was extended them and the central theme has to do with the results to the young men who took in the sights and the results to the men who stood for clean behavior. An amusing and gripping feature of the film is a boxing match between a fellow who considered himself a sport and the man whom he accused of being a "sissy" because he refused to go the limit. The man who was thus accused proved to be the better man in the fight. Later developments show infection occurring in the men who were exposed and their consequent inability to go over-seas with the expeditionary forces while their comrades who were circumspect are able to do their part and are fit to fight wherever they are needed. The lesson of the film is emphatic and to the point and is especially appealing to service men or men about military age.

THE END OF THE ROAD. The "End of the Road" is a five-reel feature with beautifully executed scenario of first-class photographic value containing numerous incidents from real life.

The story traces the life of two girls from childhood to womanhood, contrasting one who was properly trained by her mother in the facts of sex hygiene and moral deportment, with the other whose mother was opposed to such instruction and was also evidently actuated by mercenary motives in seeking her daughter's welfare. The uninstructed daughter goes through a series of distressing and tragic experiences fairly typical of the hazards that ensnare many uninstructed young girls.

The daughter of the better type of mother not only escapes many of these temptations, but when the wrong course is suggested to her by her admirer, resists in a very wholesome, natural way, insisting upon preserving her self-respect. The film is a Griffith production and in point of photography, scenario and instructiveness, as well as moral value, is one of the best that has ever been produced. The incidents that are woven into this part of the story were actually recited to Dr. Katherine B. Davis at the Bedford Reformatory by the victims themselves and were passed on in this way for the benefit they may be to the young and unsophisticated girls who have to meet the various temptations of town and city life.

VENEREAL DISEASE FILM FOR MEN. This film is a two-reel lecture film. The first reel is largely made up of animated cartoons showing the anatomy and physiology of the genitourinary organs and the formation of the secretions also its invasion by gonorrhea in the infected.

The second reel shows actual cases in the hospital, suffering from various phases of gonorrhea and syphilis. These include gonorrheal ophthalmia, gonorrheal rheumatism and lesions of syphilis in the first, second and third stages. With a suitable lecture, this film is a very clear and convincing presentation.

HOW LIFE BEGINS. The film "How Life Begins" is a four-reel production presenting the phenomena of reproduction of life in various forms of creatures beginning with the protozoa and yeast, showing very clearly the processes of segmentation and budding, tracing up to more complex forms of life; presenting a very beautiful description of the plant life from the fertilization of the seed by the pollen and picturing in the most interesting way the various parts of the flower involved in this process; also giving the life history of insects, showing the various stages in the development of the butterfly; later on, the development of the frog from the eggs through the tadpole stage up to the fully developed animal; finally it takes up the development of the chick and closes in the fourth reel with some beautiful illustrations of mother and offspring in the higher forms of animal life. The reference to the higher forms of animal life is largely inferential, the legend on the screen announcing that the principles described in the lower forms of life apply as well to the highest type of animal life. This film is adaptable for presenting in a clean and attractive way to groups of younger girls or boys the scientific facts of how life begins and normally would not

arouse any morbid curiosity but would leave the impression of the scientific fact in its natural setting as the average boy and girl in country life absorb these facts from the processes of nature with which they are surrounded. The film should be accompanied by an intelligent presentation of the lessons to be learned from it which are obviously quite simple with the younger child but more complex with the adult.

DIAGNOSIS AND TREATMENT OF GONORRHEA IN THE MALE. This is a two-reel film dealing with diagnosis and treatment technique of gonorrhea with which every practitioner should be familiar. It shows the method of securing a specimen from the urethra, how to stain the preparation by Gram's method, the two glass test, the use of the urethroscope, the pathology of chronic gonorrhea, prostatic and urethral abscess, stricture formation, passing of bougies and sounds, and prostatic massage. A speaker qualified to introduce and discuss the subject will enhance the value of this film. It is of special value to medical students, medical societies and general practitioners.

WOMAN'S LECTURE FILM — "SOCIAL HYGIENE FOR WOMEN." This is a two-reel film consisting largely of animated diagrams showing the anatomical and physiological processes relating to pregnancy, the process of fertilization, cell division, formation of the embryo, the function of the placenta and development of the child. The second deals with gonococcus infection and syphilis, and also introduces a few photographs of clinical cases. It is a very frank and vigorous presentation of the subject and should be shown only before mature women or nurses' classes. It should be accompanied by a well informed lecturer.

SLIDES

The following are brief descriptions of the sets of stereopticon slides. These sets were arranged for individual lectures but are also suitable for use in the automatic lantern.

"BILL AND JOE" SET. (For men and older boys.) This is a set of 52 slides showing the experience of two men, one known as Bill, who on becoming infected with a venereal disease goes to a reliable physician for treatment; and contrasting his experience with that of his friend Joe who goes to the fake doctor. The results are traced to the later experiences of the men dealing with their infections and the developments in their families. Numerous printed legends are inserted between the pictures so that they tell a fairly complete story without lecture. This set of slides deals very frankly with venereal disease infection and is suitable for display to men and boys over 16.

ADULT "KEEPING FIT" SET—"VENEREAL MENACE." This is a set of fifty stereopticon slides especially suited to exhibit before the mixed adult public. It contains particularly good advice and information for parents in regard to the necessity of giving proper sex instruction to their growing boys and girls. The majority of these slides deal with general health considerations and the instruction given on venereal prevention is presented in a very natural setting, emphasizing its relations to the general health of the individual.

"KEEPING FIT" SLIDES FOR BOYS AND YOUNG MEN. This set of fifty slides logically presents the general considerations of keeping fit, dealing with the general subject of exercise, bathing, sleeping, proper eating, and other lessons in personal hygiene, taking up the questions of sex hygiene, briefly, and presenting in an attractive way the essential facts every boy and young man should know. The set presents some very attractive photographs as well as many very telling legends that are bound to leave a lasting impression with any boy who sees the exhibit. The subject of venereal diseases is frankly but briefly dealt with in a few of the later slides of this set but not in a way to leave any morbid impression.

"KEEPING FIT" EXHIBITS FOR GIRLS. This exhibit consists of twenty-four double panels artistically prepared. It is directed to girls of sixteen years of age and over. It deals with problems of personal hygiene, including exercise, diet, sleeping, bathing, games; following with the subjects of sex hygiene

and moral deportment, proper dress and care of the body are presented and a few facts in regard to the communicability and nature of the venereal diseases are given.

LITERATURE. In addition to lectures with films, slides and card exhibits, we prepared certain pamphlets for free distribution and some were adopted from other sources and reprinted. Those especially prepared by our department are No. 1, Syphilis, Gonorrhea and Chancroid. No. 2, Facts for Parents. No. 3, Facts for Young Men. No. 4, Facts for Young Women. No. 5, Facts for Public Officials and Business Men. No. 11, Facts for the Adult Public. No. 12, A Talk With Mothers. No. 13, Passing on the Torch, and No. 14, Come, Girls. Those reprinted from the Public Health Service pamphlets are No. 6, Keeping Fit. No. 9, Man Power, No. 20, Sex Education. The following were reprinted from pamphlets used by the Training Camp Commission,—No. 23, When They Come Home. No. 7, Your Country Needs You and No. 8, The Nation's Call to Young Women were prepared by Mrs. Wood-Allen Chapman. No. 10, Mothers of America was reprinted from a pamphlet issued by the Minnesota State Board of Health. Following is a brief review of the pamphlets:

1. *Syphilis, Gonorrhea and Chancroid.* Contains a short account of the cause, methods of transmission and effects of each disease; a list of precautions to be observed by one infected so that he may protect others and an admonition as to the necessity for prompt and accurate diagnosis, also a portion of the amendment to the domestic relations law.

2. *Facts for Parents.* This pamphlet points out in a striking way the effects upon the family, individually and collectively, of any of these diseases. An appeal is made for more adequate education of children in matters of sex.

3. *Facts for Young Men.* Contains a warning against quackery. Sex hygiene, self-abuse or masturbation, seminal emissions and sexual indulgence are each discussed in a paragraph. Syphilis, gonorrhea and chancroid are briefly described and their transmission emphasized. Seven facts to be remembered and a list of books for men are given.

4. *Facts for Young Women.* Opens with an appeal for frankness; followed by a short description of the female organs of generation. Syphilis, gonorrhea and chancroid are discussed and attention called to the way in which they affect women. A list of books and a series of comparisons between the old and newer methods of educating girls in matters of sex conclude the pamphlet.

5. *Facts for Public Officials and Business Men.* An appeal to common sense is followed by statements of the economic ravages of syphilis and gonorrhea. The extent and the results of syphilis and the control of both of these diseases are discussed.

6. *Do Your Bit to Keep Him Fit* (out of print). A pamphlet reprinted from one distributed by the War Department. An appeal to the citizens to remove from the drafted man the temptation of prostitution and suggestions for suitable facilities for recreation. This pamphlet seemed to lose a great deal of its value with the closing of the war and has been discontinued.

6. *Keeping Fit.* Reprinted by permission of the Public Health Service. A general discussion of factors that destroy a man's efficiency is followed by the rules to be observed in developing the healthy body, in the control and conservation of manhood. A very sensible paragraph on relationships with girls closes the booklet.

7. *Your Country Needs You* (a talk with girls). A discussion for girls of the physical changes that take place in their bodies at puberty and after impregnation. Emphasizes the importance to the nation of the proper healthful living of the women of the country. A series of facts on (1) what women have believed, (2) what women know today, and (3) woman's duty, cover the last page.

8. *The Nation's Call to Young Women.* An appeal to women to consider seriously the preparation that men must undergo to make themselves fit for the army. Urges that they take similar care of their health and regard

deeply their importance to the nation. Syphilis and gonorrhea are pointed out as among our greatest enemies.

9. *Man Power.* Reprinted by permission of the Public Health Service. Adapted to boys and men. Syphilis, gonorrhea and chancroid, and the manner of their spread are discussed. A brief description of the generative organs and a warning against masturbation and quacks follow. A discussion of the feasibility of continence and control of the sex impulse completes the pamphlet.

10. *Mothers of America.* A pamphlet written by Mabel S. Ulrich, M. D., for the Minnesota State Board of Health and reprinted by us with permission. Dr. Ulrich opens her pamphlet with a statement of facts culled from government reports concerning immorality and its effects upon the youth. She then inquires into the cause of this condition and shows the responsibility of mothers. She urges the mothers to acquaint themselves with sex education and follows with a suggested method of telling a child these truths. A discussion of what a boy and girl should know at different ages closes the pamphlet.

11. *Facts for the Adult Public.* Especially prepared to outline in a brief way for the popular mind the most essential facts concerning the normal physiological functions of the generative organs of both sexes. The pamphlet also attempts to supply parents and teachers with a vocabulary, including names of anatomical parts, adapted to assist in presenting subjects of sex to children. It includes suggestions as to when and how to begin the sex education of children.

12. *A Talk with Mothers.* Outlines physical defects revealed in the draftees, including venereal diseases. Discusses double standards in an interesting and encouraging way. Presents sex education as a remedy and means of prevention of moral and physical scars left by venereal diseases.

13. *Passing on the Torch.* A narrative intended primarily for boys depicts the withering effect a venereal disease infection may have on the life of a boy. The disasters following unscientific treatment are vividly outlined. The story points a moral very well.

14. *Come Girls.* An interesting narrative intended for girls between the years 12-16. A teacher of English literature well trained in human biology conducts a series of heart to heart talks with "The English Crowd" as they call themselves. The questions of sex and morals which confront a girl of this age are all explained and discussed in a convincing and dignified way.

20. *The Problem of Sex Education in Schools.* Reprinted by permission of the Public Health Service. A brief extract of Dr. Exner's report of the results of his questionnaire to college boys. Neglect of responsibility on the part of the parent and what the teacher is able to do are next discussed. Other subjects treated are Health and Recreation, Emergency Teaching, and Sex Instruction in the curriculum. Work that may be done in the high schools, grammar schools and teachers' colleges is outlined.

23. *When They Come Home.* A pamphlet reprinted by permission of the Public Health Service. Emphasizes the necessity of being prepared to keep the boys in as good condition after they are discharged from the army as they have been in the service. Strong appeals are made for the elimination of prostitution.

26. *Circular of instruction to be given to patients by physicians when a diagnosis of syphilis, gonorrhea or chancroid is made.* It contains an abstract of the regulation which classifies these diseases among those considered communicable and another from the domestic relations law. Also detailed instructions to infected persons on how they should conduct themselves, and how they should dispose of their soiled dressings so that they may not infect others. The concluding paragraph mentions the type of laboratory test that should be made to determine the presence of either disease and the value of such test.

OTHER PUBLICATIONS. A manual entitled "The Modern Treatment of Syphilis, Gonorrhea and Chancroid" was prepared by our consultant, Dr.

Marsh. It contains detailed information and directions for making thorough and careful diagnosis of symptoms of all of these diseases and a most accurate description of the methods of preparing arsphenamine for intravenous injection and of the technique of its injection with illustrations of apparatus necessary. The treatment of gonorrhea as well as the most approved methods of testing its efficiency are very carefully described. In an appendix are outlined suggested instructions to be given persons infected with gonorrhea, syphilis or chancroid that will enable them to avoid infecting those with whom they associate. These manuals are being distributed among the physicians of the State.

A pamphlet "Compilation of Laws and Regulations Relating to Syphilis, Gonorrhea and Chancroid" was prepared containing a collection of the laws and sanitary code regulations which have a bearing upon the control of venereal diseases. The original pamphlet was prepared in 1918 and was revised this year so as to contain the amendments passed by the legislature. A copy of this pamphlet was sent to many physicians and lawyers in the State and a copy was also sent to every health officer or venereal disease control officer of each State in the Union.

In addition to the above pamphlets the bureau has distributed a number of publications for the U. S. Public Health Service. Among these are venereal disease pamphlet No. 40, Nurses Bulletin, a copy of which was sent to every nurse in the State, and The Civilian Manual for the Treatment of Syphilis and Gonorrhea, a copy of which was sent to every physician in the State who requested the same by return postal card sent him by the U. S. Public Health Service. Venereal disease pamphlet No. 36, Open Doors, and venereal disease bulletin No. 2, Responsibility of Druggists to the Public Health, were sent to all the druggists in the State.

NEW POSTERS. There is great need for new posters. Those used during the war were very effective in startling people and demanding their attention but they are not well adapted to stimulate constructive cooperation. It is generally conceded that the more effective method of eradicating disease is to provide for its prevention rather than its cure and therefore posters should be available that would put a premium on health as contrasted with disease from venereal infection. With this thought in mind the art schools and general public were invited to prepare a poster and a prize of $100 was offered to the person most satisfactorily filling the conditions outlined below.

HEALTHY PARENTS HEAD HAPPY FAMILIES

The Bureau of Venereal Diseases of the New York State Department of Health offers a prize of $100 to the person who best interprets the above expression in a colored drawing that can be reproduced as a poster in public health work.

Drawings may be made any size but must not be smaller than 12 inches by 18 inches.

Drawings may be signed by artist. Signature will be covered before seen by judges. Judges will be announced later by Dr. Hermann M. Biggs, Commissioner of Health.

Winner will be chosen from among those whose drawings are received at the New York State Department of Health, Albany, N. Y. before 5 P. M., May 1, 1920.

Drawings will be returned if artist will submit postage. It may be desirable to purchase for use elsewhere certain of those not winning the prize.

The bureau reserves the right to reject all drawings if in the minds of the judging committee none satisfactorily meet the requirements.

Posters in use by this bureau at present picture the horrors following in the wake of the venereal diseases and it is felt that for the sake of constructive work a poster depicting full, robust health should be employed.

Eighteen drawings were received from persons competing for the prize and a committee composed of Dr. James C. Ayer, an artist, Miss Ellen Babbitt of the American Red Cross and Dr. William F. Snow of the American Social

Hygiene Association were asked to decide which if any of the drawings had earned the reward. The judges in passing on the drawings considered the following points: 1. The drawing — 2. Composition — 3. Fidelity to the text — 4. Possibility of reproduction in color. In their opinion no one of the posters submitted was accepted since they considered none of them worthy of reproduction by the State Department of Health on so important a subject.

It was a great disappointment that there were so few entries to this competition. We realized the prize was small but hoped that there would be those who would be willing to compete because of the public service they could thereby render.

MEDICAL EDUCATION

SYPHILIS TAUGHT IN MEDICAL SCHOOLS. From physicians all over the State comes the criticism of their medical course that too little attention was given to the study of syphilis and gonorrhea. Most medical schools taught the facts of these diseases as they were met in the course of their clinical or pathological instructions, and only to those who elected to become urologists or dermatologists were comprehensive studies of them given. The medical schools are now taking more pains to give the students satisfactory training in the diagnosis and treatment of syphilis and gonorrhea and it is hoped that they will continue to develop the courses because every day the force of the statement attributed to Dr. Osler becomes more apparent: "Know syphilis in all its manifestations and relations and all other things clinical will be added unto you." The Division has attempted in a number of ways to help the practicing physician overcome his handicap. Members of the staff have from time to time met with county and city medical societies and read papers on the newer methods of diagnosing and treating syphilis and gonorrhea. These papers have always been received with enthusiasm and have been followed by animated discussions.

COURSES OF STUDY FOR DIAGNOSIS AND TREATMENT OF SYPHILIS. In Rochester Dr. Goler and Dr. Roby conceived the idea of arranging a course for the intensive study of the diagnosis and treatment of syphilis for a limited number of physicians in their vicinity. The Division was invited to cooperate, and in June a two weeks' course was given to two groups of physicians, each group containing a maximum of fifteen men. The four hospitals in the city were invited to cooperate and each arranged to take charge of the two groups in turn in studying the methods of administration connected with the control of venereal diseases. The work as outlined by the hospitals included inspection and careful study of ward patients who demonstrated a variety of lesions, dermatological, neural and visceral. Those hospitals which have laboratories devoted some of their time to explaining to the groups the various laboratory methods of taking and examining specimens including the Wassermann test of the blood, the colloidal test of the spinal fluid and the dark field examination of exudates. The classes were filled and the members were exceedingly enthusiastic over the opportunity for reviewing the diagnosis and treatment of syphilis, and also for the opportunity of studying the later scientific innovations. The success of this impromptu school warrants our stimulating similar programs in other cities. In November a number of physicians accepted the invitation of the U. S. Public Health Service to attend the Institute conducted in Washington for the study of venereal diseases.

CASE RECORDS. Another activity which we undertook in our efforts to assist the physicians in reviewing methods of diagnosis and treatment was to distribute among them at regular intervals reprints of a number of case records selected from those distributed by Dr. Cabot of the Massachusetts General Hospital. Permission was granted by the publishers of these records for reproduction of those selected by us. Twenty records have been reprinted and distributed among more than 2,500 physicians in the state at intervals of about one month. A brief letter accompanies each record pointing out what seems to the staff the most important feature in that particular case. It will not be possible, nor is it desirable, to distribute all of these records this year. Favorable comments have been received from many of the

physicians on this activity. A list of the records chosen and the order in which they are being distributed follows:

5251 Aortitis with coronary obstruction
5172 Aortitis with aneurism of the arch
4261 Aortitis with aneurism of the coeliac axis
4493 Aortitis with endocarditis
4441 Aortitis with regurgitation
4121 }
4122 } Aortitis
4492 Congenital syphilis
4153 Congenital syphilis
4262 Congenital syphilis
4242 Luetic periostitis
4181 Luetic pneumonia
4171 Lues and tuberculosis
4371 Lues and carcinoma
4091 Lues and brain tumor
4012 Lues and anemia
4054 Lues and duodenal ulcer
4462 Aortitis with aneurism of arch
4031 Aortitis with dilatation of aorta and endocarditis
5182 Stricture of urethra
5203 Gonorrheal abscess
4033 Pelvic peritonitis

Case records are being prepared from patients suffering with neuro-syphilis, a series of which will follow the completion of this list.

STILLBIRTHS. Many estimates have been made by men qualified to know something of the prevalence of syphilis as to the proportion of stillbirths caused by syphilis. There is no doubt in the mind of any practitioner but that syphilis is one of the most potent factors in the destruction of infants, and it was thought advisable for the Division to make some effort to stimulate the physicians to learn the true state of affairs and then apply what skill they had for its correction. A letter accordingly was prepared and directed by the Commissioner of Health to the physicians of the State asking them to cooperate with the Division by submitting specimens of blood to an approved laboratory for a complement fixation test from all women to whom a stillbirth has occurred. A copy of the letter is appended.

STATE OF NEW YORK,
DEPARTMENT OF HEALTH,

ALBANY, *July* 19, 1920.

DEAR DOCTOR.— The role played by syphilis in the community life has been widely written and spoken about since the discoveries disclosed by the medical examining boards of the draft army. As physicians we have known for a long time that syphilis has been most ruthless each year in exacting its toll of wrecked families and defective children, but how serious this tragedy is has never been determined. Many tables have been prepared attempting to show the prevalence of syphilis, but owing to the small number of cases or to the restricted group from which the data was collected, these estimates have never been accepted as applicable to the general population.

The Lancet for May 26, 1917 contains an oration delivered by the late Sir William Osler before the Medical Society of London on "The Campaign against Syphilis." This is a most excellent discussion of syphilis as a public health problem and should be read with profit by every practicing physician. His arraignment of syphilis as a destroyer of the infants is particularly drastic as is shown by these several quotations "Syphilis is perhaps the most common cause of abortion"—"When I was a pathologist and physician to an infant's home, we did not have — nor did we need — Schaudinn or Wassermann or Noguchi to tell us of what 95% of infants died during the first month. Jonathan Hutchinson and Parrott and Diday and Fournier had told us that." Osler estimated that at least 20% of the stillbirths and between 15,000 and 20,000 of the 90,000 deaths of infants within the first year reported in England for the year 1915 were due directly to syphilis.

Dr. J. Whittridge Williams reported to the New York State Medical Society that among 4,000 (1,839 white — 2,161 black) consecutive deliveries in Johns Hopkins Hospital in the period preceding December 31, 1919, there were 302 foetal deaths. Careful study revealed that syphilis was the cause of 104 or 34.44% of these deaths. It was the cause of 12.12%, or one of every eight, of the deaths among the whites and 45.23%, or almost half the deaths among the blacks. Of these 4,000 mothers 421 had a positive Wassermann reaction and antiluetic treatment was begun as early as possible. Some cases came under observation too late for the treatment to have any value, but some idea of the effects of antiluetic treatment can be observed if the patients be divided into three groups as follows:

I. In this class there were 157 women who received no treatment and "52% of the children were born dead or presented some evidence of syphilis."

II. In this class there were 103 women who received only two or three injections of salvarsan and no after treatment and 37% of the children were born dead.

III. In this class there were 163 women who received satisfactory treatment achieving a negative Wassermann and but 7.4% of the children died.

Dr. Williams concludes, "the evidence at our disposal shows that if syphilis is recognized early in the pregnant woman, and is intensively and appropriately treated, almost ideal results may be obtained as far as the child is concerned."

In an article entitled "Syphilis and its Relation to Infant Mortality" appearing in a recent number of the American Journal of Syphilis for January, 1919, the author found in reviewing the literature that in a syphilitic family:

75 per cent of all the offspring are infected.

80 per cent of the pregnancies terminate in death at or before term (a waste three times greater than is found in nonsyphilitic families.)

30 per cent of all the living births die in infancy as compared to a normal rate of 15% in the same class.

These figures are startling but must have some foundation in fact. If they are only partly true it is quite evident that we should do what we can to remedy the conditions which permit such destruction of our children. It is generally conceded by syphologists that the complement fixation (Wassermann) test of the blood is the best method of determining the presence of acquired syphilis, and I, therefore, ask you in the future to submit to the State laboratory *a specimen of blood* from every woman in your practice who has an *abortion, miscarriage* or *stillbirth*.

The State laboratory at Albany and the branch laboratory at New York City are always willing to make these tests for the physicians, free of charge. Outfits for collecting and submitting the blood can be procured of the health officer in the district or from the State laboratory. There are in certain parts of the State, laboratories approved by the State Department of Health where specimens can be sent, if that seems more desirable. If a specimen of blood is sent as a matter of routine from every such case, there can be no suspicion or stigma upon the patient and it will result in the discovery of cases of syphilis needing treatment.

Assuring you of my great interest in your work and my desire to have you cooperate in this most important public health problem, I am,

Very truly yours,

HERMANN M. BIGGS,
Commissioner.

TABLE SHOWING DISTRIBUTION OF PAMPHLETS

No.		1919	1920
1	Syphilis, Gonorrhea and Chancroid	217,572	64,845
2	Facts for Parents	142,888	57,376
3	Facts for Young Men	209,626	90,580
4	Facts for Young Women	364,872	104,695
5	Facts for Public Officials and Business Men	133,259	30,289
6	Keeping Fit	47,758	81,006
7	Your Country Needs You	39,834	17,952
8	The Nation's Call to Young Women	34,848	17,807
9	Man Power	57,122	62,097
10	Mothers of America	14,250	48,929
11	Facts for the Adult Public	....	145,304
12	A Talk with Mothers	....	35,388
13	Passing on the Torch	....	17,939
14	Come Girls	....	25,370
	Sex Education in Schools	30,263	18,279
	When They Come Home	18,056	....
		1,310,348	817.856

Miscellaneous

	1919	1920
Modern Treatment of Syphilis, Gonorrhea and Chancroid	1,885	463
U. S. Manual of Treatment (Civilian Edition)	5,575	....
Compilation of Laws and Regulations Relating to Syphilis, Gonorrhea and Chancroid	2,140	775
Responsibility of Druggists to the Public Health (United States Public Health Service Bulletin No. 2)	16,115	....
Open Doors (for Druggists) United States Public Health Service Bulletin No. 36	96,960	....
War on Venereal Diseases Must Continue (United States Public Health Service)	6,744	....
	129,419	1,238
Case records	....	26,425
Requests for literature received through the mails	13,954	8,394
Posters distributed	4,705	7,825

CITY SCORING

During 1919 an attempt was made by the United States Public Health Service to compare the venereal disease control activities of cities of the various states. A questionnaire was submitted to the several state control officers with a request to return the information for each city in his state.

This was done from all the cities in New York State, but owing to the character of information sought and the absence of a common standard upon which to base comparisons very little value could be attached to the findings. This year a more careful effort was made. The United States Public Health Service detailed from the office in Washington a number of investigators who were instructed before starting work in the manner of ascertaining the information and how to report it properly. A questionnaire of about 200 topics was used in obtaining the classified information. Free access was given the investigator to our records in order that her information might be as nearly accurate as possible. A list of the cities scored is given below with their rating and their ranking in the class of which they were a part.

Rank	City	Rate
	Population over 500,000	
3	New York	627
	Population 100,000 *to* 500,000	
13	Rochester	651
15	Buffalo	646
16	Syracuse	639
20	Yonkers	542
22	Albany	525
23	Schenectady	522
	Population 50,000 *to* 100,000	
3	Binghamton	624
10	Utica	570
16	Troy	530
	Population 25,000 *to* 50,000	
14	Niagara Falls	604
29	Amsterdam	503
35	Elmira	435
46	Kingston	389
48	Watertown	386
89	New Rochelle	241
90	Auburn	234
94	Cohoes	208
95	Mt. Vernon	200
102	Newburgh	138
	Population 25,000 *and under*	
1	Glens Falls	604
3	Middletown	595
4	Poughkeepsie	575
11	Rome	538
15	Gloversville	520
23	Ithaca	475
26	Oswego	445
33	Dunkirk	411
38	Olean	361
45	Corning	333
61	White Plains	261
81	Lackawanna	189
84	Ogdensburg	185
125	Watervliet	104
127	Lockport	102

The ratings were made on the basis of a possible 1000 points. The figures given above are probably as nearly correct in picturing the efficiency of the cities' activities as could be expected but in certain instances injustice was done because the inspector happened along at a time when the clinic attendance was low or in other instances when the clinic was but recently organized.

Medical

Staff — Consultant, Edward H. Marsh, M. D.; Inspector, Schuyler P. Richmond, M. D.; Nurse and Social Worker, Mrs. Caroline L. Chichester.

Supplemental — Physicians, Dr. F. R. Sanborn, Dr. T. W. Rhodes, Dr. L. J. Dailey; Nurses and Social Workers, Miss Roberta V. Leslie, Miss Julia MacPhillips, Miss Georgia T. Cassell.

The medical staff fundamentally consists of a consultant, inspector and nurse. The duties of the various members of this staff may be outlined in brief as follows:

The consultant is at all times available to persons in the State seeking advice in the diagnosis or treatment of a possible venereal condition. Much of his work can be done through correspondence, for in a majority of instances it means directing a patient to a specialist or physician in his or her vicinity. The consultant also makes it a point to visit each of the clinics during the year and to be present at one of the regular clinic periods in order that he may carefully observe the technique employed by the attending physician in both his diagnoses and treatments and make such suggestions and comments as he may feel are essential. He is available at all times to the clinic chiefs for assistance in difficult diagnoses or questions regarding methods of treatment.

The inspector shares certain of the duties of the consultant. He too is engaged in visiting clinics for the purposes of observing the methods of diagnosis and treatment but since he visits the clinics more frequently than the consultant, his principal function is to assist them in attaining uniformity in their methods of treatment and manner of keeping and submitting records.

The nurse and social worker has not been called upon to do any social work, but has instead been engaged with the clinic nurses in systematizing their work inside of the clinic. It is her duty to see that the nurse attached to the clinic employs the proper technique in preparing the instruments and solutions for the injections and understands how to keep the records of the clinic's activities correctly. It is her aim to be present at each clinic at three different treatment periods during the year.

Public Clinics

It was early observed that in order to make permanent progress in the control of venereal diseases, the educational activity should be supplemented by some definite concrete work that would prove to the public that this Division was advocating more than was offered by the quack physician. There is also a law which obliges the health officer to provide treatment for infected vagrants or indigents apprehended by the law and also to those persons who, unable to provide treatment for themselves, may voluntarily make application to him. Therefore, the health officers and public officials in the larger cities were persuaded to establish public clinics where indigents may be treated without charge. To aid in such establishment this Division offered to subsidize any city that undertook the organization of a clinic by supplying them with adequate equipment, providing the city would, on its part, secure a suitable location and employ a physician to do the work. The Division offered further to subsidize the clinic by supplying the required arsphenamine and by offering to pay for the first year one-half of the salary of the nurse who should be employed to assist in the clinic and to do the follow-up work. At present ten clinics in New York City and forty-two clinics outside of the city have, to a more or less extent, taken advantage of this offer and are functioning under these conditions. Provision has been made for establishing two others.

Some statement of our idea of the public clinic and its function may be opportune at this time. As stated above, primarily it was organized for the purpose of affording a concrete demonstration of the efficiency of modern methods of treatment and diagnosis both to the lay and professional members of the community. Practically it was opened as a place where indigents who had no other means of securing treatment could be cared for while in the infectious state. These two functions are paramount to us. While in a few instances the clinics have been used by civil authorities as a place where compulsory treatment may be obtained, great effort has been made to have the attendance at the venereal disease clinic as free and spontaneous

as it is at any other public health clinic. If prostitutes and other vagrants attended the clinics they did so as any individual might and were in no way distinguished from the other patients by the attending physician and nurse. At first no particular effort was made to refuse admittance to any person who presented himself, in spite of the fact that the clinic was primarily opened for the care of indigents. It was judged, and experience has since justified that opinion, that those capable of paying the private physician for treatment would not be content to sit in a clinic and await their turn for treatment after they have been convinced of the efficiency of modern methods of treatment and that there are physicians outside of the clinic as well qualified to do the work. It has always been emphasized by the Division in fostering and stimulating the clinic in its activities that it was established for the following purposes: *From a public point of view, to protect the community from the spread of two very communicable diseases; from a professional point of view, to act as a center for the dissemination of knowledge both among the profession and laity concerning the newer methods of treatment and the control of these two communicable diseases; from the patient's point of view, as a place where indigents or those infected with one of these communicable diseases and unable to employ a physician, can secure most adequate treatment; and lastly, where health officials can procure treatment for irresponsible or viciously inclined carriers of either disease.* Our position, as here outlined, is well known throughout the state and has been very generally maintained. It has helped us have most satisfactory and encouraging cooperation from the practicing physicians.

With few exceptions, the clinics have been established in conjunction with other public health clinics. At first it was thought essential to have this combination of clinics in order that the object of the patient's visit would be camouflaged. This reason no longer retains the importance it was supposed to have but other very evident reasons for such combination have developed. As a result of our combining clinics it was demonstrated that there was a great saving to the city in overhead expense and a great assistance rendered the physicians in transferring patients from one clinic to another as is frequently necessary.

The location of the clinic is a very important consideration. At first thought it would seem that a clinic should be located in a hospital. Experience has shown, however, that this is not necessary and, in fact, the hospital may be a very poor place particularly if it is situated on the outskirts of the city or in the residential section. Syphilis and gonorrhea in the early stages do not totally incapacitate or disable their victims for any great length of time and, therefore, the patient may receive treatment while he continues his daily vocation, and it is found he will do so provided that the clinic is located in a place easily accessible to him in his ordinary life and where his coming and going will not be too conspicuous. Most successful clinics have been located in the heart of the business section of the cities.

Clinic hours are a matter of consideration also. They should be selected so as not to conflict with other engagements of its possible patients. In our experience the most convenient hours have been in the evening beginning at 8 P. M. Some clinics have found an afternoon period desirable for women. At least two evening periods each week should be had by all clinics. Where the attendance is large, other periods must be provided. Several clinics, as an experiment, have tried to treat the gonorrhea and syphilis patients on separate nights.

Advertisement of the clinic, its location and hours, in the sporting columns of the daily newspapers, by posters in public rest rooms and toilets and by appropriate signs on the clinic door, have been found to be very beneficial. Much of its efficiency depends upon its equipment and arrangement of rooms. It must consist of at least two rooms but a better arrangement is to have three. There must be a waiting room and a treatment room. If two waiting rooms are available, the men and women can be separated, while the clinic hours for both remain the same. If but one waiting room is available the hours for treatment of men and women must be different. An ideal

arrangement would be to have the entrance to the clinic open into a small room where a social worker can have her desk. Leading off of this to the right and left should be the two waiting rooms. These in turn should open into the treatment room from which there should be a direct exit to the street. Thus patients can enter and leave with a minimum amount of contact with one another.

The equipment aside from the desks, record files and chairs should consist of an operating table, a still, an instrument and dressing sterilizer and instrument cabinet, apparatus for administering intravenous injections and for giving irrigations. The equipment must also include a microscope with oil immersion and dark field attachment. The standard equipment which we have supplied the clinics and for which they have made requisition to us, follows:

Furnishings

1 examining table, white enameled.
1 pad for same.
1 dressing table, white enameled.
1 stool, white enameled.
1 instrument wall cabinet, with four shelves.
1 combination instrument, water, and dressing sterilizer.
1 water still.
1 waste basket.

Apparatus

1 Janet-Frank syringe.
30 one-quarter ounce urethral syringes for patients (asepto).
1 one-half ounce urethral syringe for physician's use (asepto).
1 female urethral syringe for physician's use (asepto).
2 scalpels.
2 artery clamps.
1 dressing forceps.
1 vaginal speculum.
1 sponge forceps.
½ dozen surgical needles.
1 trocar and canula.
1 pair straight scissors.
1 grooved director.
1 dermatological curette.
2 white enamel pans.
2 white enamel pus basins.
1 double cylinder gravity apparatus for salvarsan.
2 Graeser needles 18G for salvarsan.
1 Graeser needle 20G for salvarsan.
1 Graeser needle 22G for salvarsan.
2 Luer syringes 2 cc.
1 dozen hypo. needles.
2 Luer needles 19G, 2-inch.
1 deep urethral Luer syringe
6 rubber catheters.
2 silk coude catheters.
1 silk bicoude catheter.
4 silk bougies, Nos. 10, 12, 14, 16F.
12 steel sounds, Nos. 16, 17, 18, 19, 20, 21, 22, 24, 26, 28, 30, 32F.
5 tunneled sounds, Nos. 9, 10, 11, 13, 15F.
6 whalebone filiform bougies.
1 glass irrigator with wall attachment.
1 dozen glass tips for irrigator.
1 Kohlmann dilator, straight.
1 microscope with oil immersion lens.
1 dark field attachment for same.
1 mechanical stage for same.
1 light for same.

This equipment was furnished subject to the following conditions:

I. Equipment shall always be open to inspection by representatives of the Division of Venereal Diseases, State Department of Health.

II. Physician to take charge of clinic shall be approved for the work by this Division.

III. Clinic will keep records of cases treated on blanks furnished or approved by this Department and will report each case with information desired on cards furnished for that purpose.

IV. A follow-up service will be organized by which all patients will be kept under regular treatment until discharged under rules and regulations adopted by municipality according to requirements of Chapter 264, Sec. 343-0, Public Health Law.

V. Arsphenamine will be supplied by the Division without charge for use in clinic on cases where it would be a hardship for the patient to pay for commercial product. For this purpose a well known approved commercial product will be furnished until such time when the Division of Laboratories shall be able to manufacture the same.

It is understood that this equipment is furnished free of charge to the clinic by the State Department of Health for use in the clinic in cooperation with the municipality in its efforts to control the spread of venereal diseases. The equipment is accepted with the understanding that it shall remain the property of the State Department of Health but under the control of the Health Officer and for the use of the city so long as it is actively used and the conduct of the clinic is approved by the State Department of Health.

To assist in keeping the records of the clinic the cards and forms described below have been devised by the Division and supplied to those clinics making requisition.

Appointment Card

Date	Appointments
Name	Name

Treatment Cards

SYPHILIS

Name..Page..............

DATE	Date next appointment	Arsphenamine	Mercury	Iodide	Weight	Urine	Remarks	Wassermann

GONORRHEA

Name..Page..............

DATE	Date next appointment	1st urine	2d urine	Treatment	Remarks	Microscopic examination

Medical History Card

Venereal clinic at...

Name..Date..............................

Address...

Occupation..Age..M. S. W. D

Diagnosis...

Past history...

Source of infection...

Date, appearance of first symptom.......................................Incubation period..............

Present symptoms ....

Previous treatment...

Physical examination...

Urine ....

Microscopic examination...

Wassermann test..

Record cards employed by the clinics.

DAILY RECORD

VENEREAL DISEASE CLINIC

Month of...192........

Date..

		Sex	Old	New	Readm.	Old	New	Readm.
TREATED CASES	Syphilis	M						
		F						
	Gonorrhea	M						
		F						
	Chancroid	M						
		F						
	Nonvenereal	M						
		F						
	New patients examined found nonvenereal, not treated	M						
		F						
	Persons visiting clinic for advice only	M						
		F						
	Cases not diagnosed	M						
		F						

			Syp.	Gon.	Chan.	Nonven.	Syp.	Gon.	Chan.	Nonven.
DISCHARGED PATIENTS	No. of patients placed under observation	M								
		F								
	Cured	M								
		F								
	Probably cured	M								
		F								
	Noninfectious — not cured	M								
		F								
	Referred to hospital, other clinic or physician	M								
		F								
	Discontinued without permission	M								
		F								
	Died	M								
		F								
	Treatments administered	M								
		F								
	Doses arsphenamine administered	M								
		F								
	No. of reactions	M								
		F								

DAILY RECORD

VENEREAL DISEASE CLINIC — (*Concluded*)

		For Diagnosis			For Treatment Control			For Diagnosis			For Treatment Control		
		Pos.	Neg.	D.	Pos.	Neg.	D.	Pos.	Neg.	D.	Pos.	Neg.	D.
Number of Wassermann reports received	M												
	F												
Number microscopic examinations for treponema pallidum	M												
	F												
Number microscopic examinations for gonococcus	M												
	F												

REMARKS:

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....

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MONTHLY VENEREAL DISEASE CLINIC REPORT

Clinic..Location..................................

Month.........................192

	Syphilis		Gonorrhea		Chancroid		Nonvenereal		Total	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1 Total patients continuing treatment from last month										
2 Cases undiagnosed during previous month										
Gains (Report a case only under one heading)										
New Patients										
3 New patients admitted for treatment										
4 If patient has two diseases enter second disease here										
Note: Encircle figures and do not include in lines 7 and 11.										
Former Patients Readmitted										
Former patients readmitted for treatment who had discontinued										
5 With permission										
6 Without permission										
7 Total patients admitted for treatment during month										
Note: Do not include figures in line 4.										
8 New patients examined, found nonvenereal and not treated at clinic										
9 Persons visiting clinic for advice only										
10 Cases not diagnosed										
11 Total persons admitted to clinic during month										
Note: Do not include figures in line 4.										
Losses (Report a case only under one heading)										
12 Number of patients placed under observation during current month										
13 Number of patients discharged (with permission)										
Cured										
Probably cured										
Noninfectious but not cured										
Referred to hospital, other clinic or physician										
14 Discontinued treatment without permission										
15 Died										
16 Total persons discharged and discontinuing treatment										
17 Total patients remaining under treatment at end of month										
18 Total patients under observation										

	Syphilis		Gonorrhea		Chancroid		Nonvenereal		Undiagnosed		Total	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Total original visits to clinic during month (new patients admitted)	....	....	....	....	....	....	....	....	....	....	....	....
NOTE.— The total should include venereal, nonvenereal and undiagnosed.												
Total revisits	....	....	....	....	....	....	....	....	....	....	....	....
(Any patient previously attending clinic for same disease.)												
Total treatments administered during month	....	....	....	....	....	....	....	....	....	....	....	....
NOTE.— Administration of any drug or prescribing any medicine constitutes a single treatment. Injection of mercury and intravenous injection of arsphenamine should be considered two treatments although given same patient same day.												
No. cases hospitalized (sent from clinic)	....	....	....	....	....	....	....	....	....	....	....	....
No. cases placed in detention	....	....	....	....	....	....	....	....	....	....	....	....
No. cases released from detention	....	....	....	....	....	....	....	....	....	....	....	....

No. of operations:	Major	Minor
Male	....	....
Female	....	....

	Positive		Negative		Doubtful	
Laboratory examinations:	Male	Female	Male	Female	Male	Female
1 No. of Wassermann tests reported from laboratory:						
For diagnosis	......	......	......	......	......	......
For treatment control	......	......	......	......	......	......
2 No. of microscopic exams. for *treponema pallidum*	......	......	......	......	......	......
3 No. of microscopic exams. for the gonococcus:						
For diagnosis	......	......	......	......	......	......
For treatment control	......	......	......	......	......	......

No. of doses of arsphenamine (or similar products) administered... Male........ Female......
No. of reactions *........ Male........ Female......
No. of persons receiving early (prophylactic) treatment.......... Male........ Female......

Personnel and services:
No. of physicians......nurses......social workers......male attendants......clerks......
Days of week and hours clinic is open..........
Total number of clinic days during month.................... No. clinic hours............

Signature..............................

(Title)......................

* Please furnish separate detailed reports of all reactions.

The public clinics, in recognition of the subsidy received from the state, make no charge for the treatments administered. This has proved a most satisfactory arrangement so far as keeping the patient coming to the clinic is concerned, but there has been some opposition to treating charitably every person who makes application. The first point of opposition was that many people were coming from outside the city and that inasmuch as the city was contributing to the support of the clinic they thought it only fair that if the county or other districts wish to make use of it they should assist in its support. Another reason advanced for making a charge at least to some patients who come to the clinics for treatment was based on the observation that among the patients may be found some who are by no means indigents and who could well afford to pay a private physician for their care. In this connection, and in defense of the policy of at present treating free of charge all who come to the clinic, it must be said that until recently there were few physicians who would admit to their practice cases of syphilis and gonorrhea and in some instances the clinic still remains the only place where infected persons can feel assured of receiving competent care.

Successful treatment of venereal diseases has always been difficult because patients lose interest before a cure is effected and in many instances feel that they are being imposed upon by the physician if asked to continue the treatment after the disappearance of symptoms and signs with which they were familiar. The results of this have been that in after years it has not been unusual for persons having had a course of treatment and feeling secure in their health to be surprised to discover the disease still lurking in them. In our public clinics we have endeavored to escape this pitfall by making it possible for every patient to continue treatment without incurring a financial burden and by employing nurses and follow-up workers to educate the patient to the necessity of treatment over a long period of time. It has been found possible to continue the interest of the majority of the patients by this method but it is very doubtful whether such interest could be maintained if even a nominal fee were charged for each treatment.

Other Clinics

In addition to those public clinics established by boards of health in the cities as outlined above, certain institutions were encouraged to open clinics both for the treatment of their inmates and others who might come to them from the vicinity. These clinics were not subsidized as heavily as were the board of health clinics, but in all instances they were given the salvarsan and the minimum apparatus essential for the administration of salvarsan. Certain of the large industries were encouraged to open clinics for their employees. The Division had nothing to do with equipping these clinics other than offering suggestions as to the character and quality of the apparatus. Arsphenamine was not supplied to them but an offer was made to have examined at our laboratory all the specimens of blood that might be taken.

The Division cooperated with the Department in its conduct of consultation clinics. These clinics were advisory in nature and were held in six different parts of the State. Few cases of venereal diseases were brought to them for consultation but in studying other cases syphilis and gonorrhea were discovered. At several of the clinics the physicians in charge requested the complement fixation test as a routine measure in all examinations.

During the year 1919 and the early part of 1920 special effort was made by the Division to demonstrate a venereal disease clinic in operation before the various medical societies of the State. A surgeon with instruments and apparatus visited the medical societies of the State at the time of one of their regular meetings and administered salvarsan to those patients brought to the meeting by members of the local society. These clinics were very popular among the medical profession. They were very well attended and stimulated considerable discussion among the physicians as to the merits of various forms of treatment and methods of confirming diagnosis. At the

Annual Conference of Health Officers held at Saratoga in 1919 and in 1920 the division set up complete equipment for a model clinic in rooms apart from the regular meeting rooms. The consultant of the division was in attendance at the clinic at certain times during the conference in order to demonstrate to the physicians the uses of the various pieces of apparatus and the method of preparing arsenical solutions.

Treatment of Syphilis

Recognizing that the most effective procedure in controlling the spread of syphilis and gonorrhea is to treat the infected successfully, it was made a point by the Division that every clinic established should adopt the most successful scientific methods of diagnosing and treating the patients admitted and better to insure this it was stipulated as part of the agreement under which equipment was given to city boards of health that the qualifications of the physician appointed to take charge of the clinic should meet the approval of the Division. The consultant whose duty it became to approve of the clinic physicians suggested for appointment, arranged with four of the large dispensaries of New York City that physicians in charge or who expected to take charge of up-state clinics might spend time in their clinics perfecting their technique. It was volunteered by the physicians in charge of these dispensaries that they would give the visiting physicians an opportunity to assist in diagnosing and treating the regular cases that came to the clinic. Many of the physicians availed themselves of this opportunity and some continue even at this date to visit those large clinics at irregular intervals.

For several reasons, among these the desire for more or less uniformity in the treatment and care of syphilis patients, it was thought advisable to prepare a scheme that would accord with the latest methods. Accordingly our consultant outlined a course of treatment that should extend over two years and copies of the outline were distributed among the clinics. In an article written in explanation of this outline Dr. Marsh said in part:

"It is an easy matter to determine when to commence treatment in any case of syphilis; it should be done as soon as the diagnosis is made. But when to stop treatment is the question which is puzzling to everyone. The clinical manifestations of the disease will clear up promptly under modern methods of treatment, and then the practitioner faces the question — how long must treatment be continued? It is obviously impossible to lay down any hard and fast rules. In the first place it must be remembered that we are treating an individual suffering with the disease and not treating the disease. Therefore, variations must be necessary to fit the various individuals, but there should be some guiding principles in order that the greatest benefit may accrue to the greatest number of people.

For the above reasons the writer has attempted by means of the accompanying chart to outline the treatment which should be administered to a patient suffering with syphilis. It is not expected that this outline will be followed in every individual case; it is merely suggestive.

The chart is divided into two portions — the first showing the treatment to be administered to those cases where the disease is seen at an early period, namely, in the presence of primary lesions previous to the time when the Wassermann reaction becomes positive. Such cases should receive an intensive course of treatment, using both arsphenamine and mercury, the arsphenamine to be administered at from three to five-day intervals, the mercury to be administered either by daily injections of a soluble preparation or semi-weekly to weekly injections of an insoluble preparation. Treated in this manner it may be expected that nearly all cases will not only clear up promptly clinically but will remain serologically negative, and if followed over a period of years will never have a positive Wassermann reaction unless re-infection occurs. In those cases where the Wassermann reaction has already become positive, treatment must be carried on for a far longer period of time. In the chart a minimum period of two years is indicated during

which fifty injections of arsphenamine are to be given, and mercury administered over a total period of fifty weeks. This would be given to those cases in which the Wassermann reaction became negative following the first course of treatment. If the Wassermann reaction remained positive following the first course of treatment the number of arsphenamine injections would be increased by a minimum of eight, and the amount of mercury increased by administration over a period of fifteen weeks longer. There are doubtless cases in which, regardless of the amount of arsphenamine and the amount of mercury administered, the Wassermann reaction will remain positive. In such cases it may be necessary to cease treatment entirely except at long intervals when short courses may be given. Such cases should, however, be under continuous observation for the remainder of their lives in order that treatment may be re-instituted at the earliest sign if active syphilitic manifestations again appear. The dose of arsphenamine should be approximately one decigram for each twenty-five pounds body weight; if neo-arsphenamine is used the dose should be 50 per cent more. Mercury should be administered to the point of tolerance. In the chart there is no mention made of potassium iodid. The writer does not believe that potassium iodid per se influences the cure of syphilis. It is of great value in the presence of certain indications, such as gummatous formations, increased blood pressure, persistent headaches, etc.

Before discharging any case, examination should be made of the spinal fluid, and if the result is positive, treatment must be continued even though the blood Wassermann is negative.

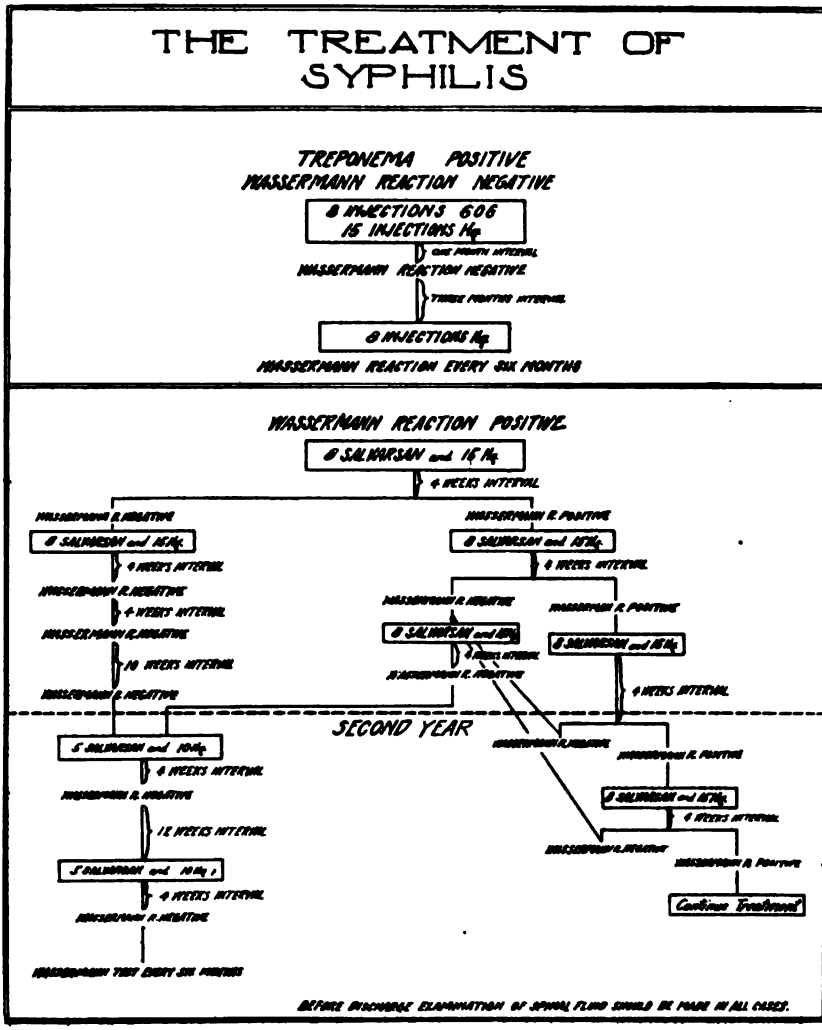
In conclusion, the following facts should be emphasized:

1. The earlier treatment is instituted in the course of the disease the better the chances of recovery.
2. Most cases of syphilis are not treated over a sufficiently long period of time.
3. The value of one negative Wassermann reaction is nil.
4. At the first visit of the patient the necessity for long-continued treatment should be clearly brought to his attention, otherwise it is impossible to secure his cooperation at a later period.
5. To be effective, arsphenamine should be administered at frequent intervals, and mercury should be administered to the point of tolerance."

For the general clinic procedure the consultant prepared a special booklet which was very widely distributed both among the clinics and practicing physicians A few years ago there was such a diversity of opinion as to the correct way of treating syphilis, and since many men are yet to be convinced that arsenical preparations are superior to iodides, it was decided arbitrarily to ask that this one method be adopted in the clinics. The physicians have been cautioned to exercise the greatest care in administering their drugs so as to avoid reactions or accidents, and it can be said with pleasure that it is to their credit that no serious accidents or reactions have been reported from any of our clinics which could be attributed to lack of technique on the part of the physician.

Drugs

During the early part of 1920 the arsenical preparation used by the clinics and provided by the Division was arsphenamine secured from the Dermatological Institute in Philadelphia. During that year the State Laboratory began distributing a product of its own manufacture which has proved to be equally as satisfactory as any drug on the market and it will be allowed to replace the commercial product as rapidly as it can be manufactured. At present arsphenamine is distributed only among the clinics. It is to be hoped that in the not far distant future it will be distributed as freely among all the practicing physicians as are antitoxins and serums today. None of the neoproducts have been manufactured or distributed by the State. This discrimination was not made because of any lack of faith in the neoproducts but it was thought better while the work was in process of organization to limit the possible sources of error or confusion.


THE TREATMENT OF SYPHILIS
TREPONEMA POSITIVE
WASSERMANN REACTION NEGATIVE
8 INJECTIONS 606
15 INJECTIONS Hg
WASSERMANN REACTION NEGATIVE
8 INJECTIONS Hg
WASSERMANN REACTION EVERY SIX MONTHS
WASSERMANN REACTION POSITIVE
8 SALVARSAN and 15 Hg
4 WEEKS INTERVAL
WASSERMANN R. POSITIVE
8 SALVARSAN and 15 Hg
4 WEEKS INTERVAL
4 WEEKS INTERVAL
WASSERMANN R. NEGATIVE
4 WEEKS INTERVAL
10 WEEKS INTERVAL
8 SALVARSAN and 15 Hg
4 WEEKS INTERVAL
SECOND YEAR
5 SALVARSAN and 10 Hg
4 WEEKS INTERVAL
12 WEEKS INTERVAL
5 SALVARSAN and 10 Hg
4 WEEKS INTERVAL
Continue Treatment
BEFORE DISCHARGE EXAMINATION OF SPINAL FLUID SHOULD BE MADE IN ALL CASES.

Treatment of Gonorrhea

As there is no accepted standard in the treatment of gonorrhea the procedures necessarily vary in the different clinics. Men suffering with this disease in the very acute stage are as a general rule given no local treatment until the symptoms have subsided to some extent. Most of the clinics at this time give hand injections of one of the following drugs: Potassium permanganate, protargol, argyrol, acraflavine or mercurochrome. The subacute and chronic cases are usually found to be suffering with an infection of the prostate gland and treatment then is directed to this organ.

The result of treatment with the different drugs mentioned above do not seem to vary in any considerable degree. In most of the clinics, patients are seen not oftener than twice a week, which handicaps treatment and prolongs its course.

Women suffering with gonorrhea are treated with a cleansing douche, self administered, and topical applications of various drugs, such as iodine, argyrol, silver nitrate, etc. Recent investigations seem to point to preparations of dyestuffs as a logical treatment in gonorrhea, both in the male and the female, but up to the present time the results in clinical cases have not borne out the expectations conceived by animal experimentation.

Tabulations of Reports from Clinics

It is very difficult to picture the work accomplished by the clinics. Figures can be given to show how many persons visited them, how many examinations were made, how many treatments given and how many consultations for advice but no one can tell how many lives were saved, how many unborn were given an opportunity to be born alive and with good health, how many homes were preserved, how many wretched lives were restored to good health nor how much wealth was added to the community by the restoration of actual or potential invalids to the productive class. Some of the things that figures can show are here set down.

There were admitted during the year to thirty-six clinics whose records are most complete 4,612 patients, 2,612 of whom were men and 2,000 women, for the treatment of one or more venereal diseases. Another 1,651 men and 975 women were found to be ill but not with any of the three specific venereal diseases. Some of these received treatment but more than 75 per cent were persuaded to seek the care of their family physician. Eight hundred and eighteen men and 338 women came to the clinics for advice on questions relating to venereal diseases.

A total of 76,604 treatments were given to these 4,612 patients during the year while 22,556 of these treatments were administrations of arsphenamine. The administration of arsphenamine is in the nature of an operation consisting of the injection of 50 cc to 200 cc of solution into a vein of the patient. It is always attended with more or less danger of harm to the patient but owing to the great care exercised in the clinics by the trained personnel no serious accidents occurred in this great volume of work.

NEW ADMISSIONS TO CLINICS DURING SIX MONTHS JANUARY 1 TO JUNE 30, 1920

	Venereal							Nonvenereal							Grand total
	Jan.	Feb.	Mar.	April	May	June	Total	Jan.	Feb.	Mar.	April	May	June	Total	
South End Dispensary	5	1	3	3	....	3	15	....	1	....	2	1	2	6	21
Albany Hospital	4	4	1	10	....	4	23	....	....	1	....	....	....	1	24
Amsterdam	5	3	4	....	2	3	17	6	1	1	2	....	3	13	30
Binghamton	22	12	28	17	18	22	119	18	14	11	36	35	42	156	275
Buffalo — Court Street	75	89	104	78	82	71	499	53	48	64	53	38	57	313	812
Buffalo — Municipal	22	19	19	10	25	18	113	10	16	10	6	13	7	62	175
Corning	4	....	3	5	12	6	30	2	....	21	13	7	8	51	81
Dunkirk	3	2	5	....	....	....	10	....	8	3	6	....	3	20	30
Elmira	....	....	6	10	28	26	70	....	....	1	13	15	27	56	126
Glens Falls	7	7	12	7	1	1	35	6	4	....	2	1	1	14	49
Gloversville	....	2	2	2	....	2	8	1	1	1	9	5	....	17	25
Hornell	....	....	14	11	8	7	40	....	....	2	1	....	20	23	63
Ithaca	13	5	12	17	11	10	68	3	7	9	10	1	....	30	98
Jamestown	4	4	10	7	....	2	27	1	....	....	....	2	2	5	32
Kingston	1	1	....	1	....	3	6	....	....	1	4	1	....	6	12
Little Falls	1	5	4	1	1	1	13	....	....	....	1	....	....	1	14
Middletown	3	1	2	4	2	5	17	2	4	2	2	....	5	15	32
Niagara Falls	4	9	15	9	13	13	63	20	16	16	13	16	26	107	170
North Tonawanda	2	8	9	1	1	2	23	6	11	8	2	1	5	33	56
Oswego	8	3	2	1	1	3	18	2	7	2	....	2	2	15	33
Port Chester	....	....	....	6	13	5	24	....	....	....	2	7	3	12	36
Poughkeepsie	4	5	5	4	2	3	23	2	2	3	2	5	2	16	39
Rochester — Baden Street	23	13	3	18	11	21	89	11	5	6	6	4	3	35	124
Rochester — General Hospital	12	7	13	22	8	18	80	4	7	4	4	9	17	45	125
Rochester — Hahnemann	1	....	3	3	2	2	11	1	....	....	4	4	....	9	20
Rochester — Health Bureau	38	21	27	25	10	20	141	90	52	83	23	103	69	420	561
Rochester — Homeopathic	5	2	7	6	6	5	31	12	2	5	5	4	1	29	60
Rome	4	3	7	4	6	15	39	3	....	....	1	2	....	6	45
Schenectady	12	8	15	10	13	8	66	7	....	3	1	7	4	22	88
Syracuse Free Dispensary	46	40	40	52	52	41	271	....	....	....	....	....	....	....	271
Troy	14	4	3	5	7	4	37	7	1	3	6	6	2	25	62
Utica	22	11	22	11	15	21	102	11	20	8	13	9	28	89	191
Yonkers	12	8	11	3	4	7	45	10	9	9	18	14	18	78	123
Albany House of Good Shepherd	4	....	1	2	....	....	7	3	3	2	2	2	1	13	20
Troy House of Good Shepherd	2	....	6	4	5	5	22	4	....	7	5	10	1	32	54
Syracuse Noxon St. Dispensary	2	4	2	1	2	1	12	6	4	2	2	3	2	19	31
	384	301	420	370	361	378	2,214	301	243	288	269	327	366	1,794	4,008

New Admissions to Clinics During Six Months July 1 to December 31, 1920

	Venereal							Nonvenereal							Grand total
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	
Albany So. End Dispensary	4	2	11	5	6	8	36	2	1	4	....	10	2	10	55
Albany Hospital	1	1	1	3	1	....	7	....	1	....	1	....	....	2	9
Amsterdam	....	....	4	2	....	3	9	3	1	1	5	1	3	14	23
Binghamton	18	11	16	6	9	14	74	24	47	22	11	16	18	138	212
Buffalo Urologic	....	....	....	....	18	17	35	....	....	....	....	....	1	1	36
Buffalo Municipal Hospital	27	12	15	18	16	32	120	9	14	9	10	13	10	65	185
Buffalo Court St. Disp.	132	120	102	113	101	90	658	82	66	96	115	91	74	524	1,182
Corning	3	2	5	1	4	4	19	3	5	1	....	13	2	24	43
Dunkirk	....	4	3	2	2	....	11	4	2	3	4	1	5	19	30
Elmira	20	22	15	11	11	15	94	7	3	2	4	....	10	26	120
Glens Falls	1	1	1	2	6	10	21	....	4	2	....	12	9	27	48
Gloversville	3	2	3	....	2	2	12	5	9	3	6	8	9	40	52
Hornell	3	3	....	9	3	6	24	18	5	8	4	16	10	61	85
Ithaca	10	7	11	11	11	6	56	2	3	4	2	5	6	22	78
Jamestown	3	6	1	2	1	2	15	....	....	3	....	....	1	4	19
Kingston	....	2	1	1	2	....	6	1	....	....	1	....	9	11	17
Little Falls	6	3	....	1	1	2	13	....	....	1	2	....	....	3	16
Middletown	8	4	6	....	....	....	18	....	....	....	....	....	....	....	18
New Rochelle	5	4	4	10	3	7	33	6	1	2	4	5	6	24	57
Niagara Falls	9	5	12	9	12	13	60	19	12	11	9	17	17	85	145
North Tonawanda	5	1	3	3	3	2	17	5	13	2	5	6	9	40	57
Oswego	3	1	1	....	....	4	9	7	....	....	1	4	2	14	23
Plattsburg	....	....	....	2	2	....	4	....	....	....	1	....	....	1	5
Port Chester	3	2	3	7	5	3	23	....	2	3	5	4	8	22	45
Poughkeepsie	3	....	6	4	5	11	29	6	3	8	16	4	4	41	70
Rochester Baden St. Disp.	19	17	8	13	5	18	80	15	6	2	6	3	....	32	112
Rochester General Hospital	11	13	19	11	10	20	84	21	5	9	5	14	14	68	152
Rochester Hahnemann Hospital	2	1	2	5	1	....	11	....	....	1	1	....	....	2	13
Rochester Health Bureau	27	21	15	12	20	21	116	102	....	16	33	96	55	302	418
Rochester Homeopathic	6	3	2	2	4	5	22	....	1	3	4	2	4	14	36
Rome	6	12	7	11	4	7	47	11	6	3	8	3	6	37	84
Schenectady Health Center	9	9	....	5	9	8	40	2	7	....	7	2	5	23	63
Syracuse Free Dispensary	42	37	39	50	58	65	291	....	....	....	....	....	....	....	291
Troy	8	4	8	11	5	11	47	6	7	7	1	9	8	38	85
Utica	26	26	17	21	23	18	131	10	6	1	12	39	81	149	280
Yonkers	15	16	9	14	10	15	79	12	20	25	14	10	17	98	177
White Plains	....	....	4	2	1	5	12	....	....	....	2	2	4	8	20
Albany House of Good Shepherd	....	2	....	....	1	1	4	1	....	3	3	2	....	9	13
Troy House of Good Shepherd	2	2	4	....	3	....	11	....	29	14	21	40	....	104	115
Syracuse Noxon Street Dispensary	6	2	1	4	2	5	20	2	4	8	6	5	11	36	56
	446	380	359	383	380	450	2,398	385	283	277	329	453	420	2,147	4,545

SUMMARY OF REPORTS OF CLINICS FROM JULY 1, 1920 TO DECEMBER 31, 1920

MONTHS July 1 — December 31, 1920	GAINS																							
	NEW PATIENTS ADMITTED FOR TREATMENT								FORMER PATIENTS READMITTED								Total patients admitted for treatment during six months		New patients examined, found non-venereal, and not treated		Admitted for advice only		Total persons admitted	
	Syphilis		Gonorrhea		Chancroid		Non-venereal		Syphilis		Gonorrhea		Chancroid		Non-venereal									
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Albany South End Dispensary	15	8	11	1	1	...	1	1	20	9	2	1	...	...	1	2	51	22	8	7	...	...	77	42
Albany Hospital	2	1	2	...	2	...	2	...	4	...	3	...	...	...	...	...	15	1	...	...	...	...	23	1
Amsterdam	1	2	5	1	...	...	1	...	8	4	2	2	...	...	...	...	17	9	5	5	1	1	40	24
Binghamton	30	16	27	1	...	...	...	...	14	4	...	...	...	...	...	...	71	20	24	6	76	32	266	83
Buffalo Urologic	23	11	...	...	1	...	1	...	2	2	...	...	...	...	...	...	27	13	...	...	...	...	27	13
Municipal Hospital	48	20	23	23	6	...	19	2	...	...	...	...	...	...	...	...	96	45	14	26	...	...	124	95
Court Street Dispensary	249	88	290	13	18	...	108	...	152	41	115	3	11	...	16	1	959	146	282	63	63	8	1,668	290
Corning	7	4	4	3	1	...	3	...	1	2	...	...	...	...	...	...	16	9	3	1	7	5	42	27
Dunkirk	5	1	4	...	1	...	2	...	...	2	...	...	...	...	...	...	12	3	7	4	6	...	27	9
Elmira	32	21	33	8	...	...	2	...	6	4	2	3	...	...	1	...	76	36	9	5	6	1	132	60
Glens Falls	5	5	10	1	...	...	...	...	6	2	4	...	...	...	...	...	25	8	8	4	1	...	52	27
Gloversville	5	4	1	1	1	...	...	...	2	10	...	...	...	...	...	...	9	15	7	9	7	14	32	44
Hornell	7	8	4	4	1	...	5	8	7	8	...	1	...	...	...	...	24	29	8	12	15	11	59	65
Ithaca	12	8	27	9	...	...	4	1	20	14	12	2	...	...	1	...	76	34	2	5	6	3	101	44
Jamestown	6	3	4	2	...	...	...	...	...	...	...	...	...	...	...	...	10	5	3	...	...	...	19	6
Kingston	3	3	...	...	...	...	...	...	1	2	...	...	...	...	...	...	4	5	2	9	...	...	6	16
Little Falls	9	3	...	1	...	...	...	...	1	3	...	...	...	...	...	...	10	7	1	2	...	...	23	11
Middletown	6	11	1	...	...	...	...	...	3	1	...	...	...	...	...	...	10	12	...	...	...	...	22	23
New Rochelle	4	14	14	1	...	...	3	5	3	2	...	...	...	...	...	...	24	22	3	7	1	2	29	33
Niagara Falls	20	6	25	3	6	...	15	...	20	6	2	...	...	...	...	...	88	15	35	16	12	5	173	47
North Tonawanda	10	1	6	...	...	...	4	1	2	...	...	...	...	...	...	...	22	2	8	1	8	5	50	12
Oswego	6	1	2	...	...	...	5	4		1	...	1	...	...	...	...	21	7	1	2	...	...	32	13
Plattsburg	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	1	...	...	...	4	1
Port Chester	10	5	7	1	...	...	...	...	1	...	1	...	...	...	...	...	19	6	3	4	1	...	44	34
Poughkeepsie	13	12	8	1	...	...	3	6	4	4	...	1	...	...	...	...	23	24	5	19	5	...	54	60
Rochester Baden Street Dispensary	31	21	27	1	...	...	16	...	2	...	...	...	...	...	...	...	76	22	2	...	11	3	164	106
Rochester General Hospital	30	39	6	9	...	...	...	...	11	4	...	...	...	...	...	...	47	52	34	20	1	...	160	146

Rochester Hahnemann Hospital	6	5	...	...	...	...	...	...	2	2	...	...	...	...	...	...	8	7	1	1	...	...	24	26
Rochester Health Bureau	58	10	44	4	...	...	69	19	...	...	...	...	...	...	...	...	171	33	64	36	85	29	320	98
Rochester Homeopathic	13	8	1	...	...	...	...	...	9	15	...	...	...	...	...	...	28	23	4	4	1	1	42	46
Rome	22	9	15	1	...	...	...	1	3	1	4	...	1	...	...	...	45	12	15	14	1	...	96	34
Schenectady Health Center	8	4	22	5	1	...	...	...	...	...	...	...	...	...	...	...	31	9	9	8	2	3	77	36
Syracuse Noxon Street Dispensary	...	12	...	8	...	...	...	...	...	2	...	...	...	...	...	...	...	22	2	33	...	1	2	56
Syracuse Free Dispensary	73	33	167	11	7	...	...	...	126	77	77	...	1	...	...	...	451	141	...	...	...	...	532	182
Troy Municipal Clinic	7	16	19	4	1	...	9	7	11	7	3	...	...	...	...	1	50	35	9	9	3	1	99	60
Utica	26	29	61	15	...	...	8	5	20	29	14	16	...	...	...	...	129	94	43	42	25	5	254	161
Yonkers	30	16	31	...	2	...	28	6	...	...	2	2	...	...	2	...	95	24	27	21	...	...	236	75
White Plains	6	5	1	...	...	...	...	1	...	...	...	...	...	...	...	...	7	6	3	3	...	...	10	10
Albany House of Good Shepherd	...	2	...	2	...	...	...	...	...	15	...	5	...	...	...	1	...	25	...	8	...	1	....	46
Troy House of Good Shepherd	...	10	...	1	...	...	...	48	...	9	...	...	...	...	...	2	...	70	...	53	...	...	....	153
Totals	840	476	898	135	49	...	308	115	469	282	243	37	13	...	21	7	2,841	1,071	652	459	344	131	5,142	2,315

SUMMARY OF REPORTS OF CLINICS FROM JULY 1, 1920 TO DECEMBER 30, 1920 — (*Concluded*)

MONTHS July 1 — December 31, 1920	Losses: Total patients placed under observation		Losses: Total persons discharged and discontinuing treatment		Total Treatments Administered: Syphilis		Total Treatments Administered: Gonorrhea		Total Treatments Administered: Chancroid		Laboratory Examinations: Wassermann Tests		Laboratory Examinations: Microscopic: Treponema pallidum		Laboratory Examinations: Microscopic: Gonococcus		Number doses arsphenamine administered	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Positive	Negative	Positive	Negative	Positive	Negative	Male	Female
Albany South End Dispensary	27	11	23	13	247	181	92	25	....	....	22	33	....	....	14	6	131	105
Albany Hospital	6	....	10	....	71	10	110	....	3	....	8	20	....	1	3	17	31	7
Amsterdam	5	4	5	5	257	197	243	31	....	....	10	18	....	....	13	5	157	116
Binghamton	....	....	85	20	1,239	517	464	6	....	....	101	91	....	....	40	5	700	261
Buffalo Urologic	....	....	5	2	77	44	....	....	....	....	7	....	....	....	....	....	69	45
Municipal Hospital	....	....	93	52	271	163	1,263	1,260	96	....	76	126	....	....	118	241	244	129
Court Street Dispensary	44	11	1,001	133	3,116	1,205	6,128	91	41	....	248	602	....	....	171	162	1,842	593
Corning	4	3	1	....	79	73	29	9	9	....	10	2	....	....	3	....	99	77
Dunkirk	3	1	9	2	64	18	283	11	7	....	9	15	....	....	43	63	20	8
Elmira	18	8	53	18	393	303	219	72	....	....	62	44	....	....	19	19	247	250
Glens Falls	5	3	12	4	166	233	121	....	....	....	13	16	....	....	6	8	64	41
Gloversville	5	8	7	1	205	165	4	....	....	....	17	16	....	....	6	8	92	77
Hornell	21	23	3	5	147	171	9	10	....	....	22	9	3	....	9	....	100	121
Ithaca	46	20	33	12	320	253	440	176	....	....	30	22	7	5	354	16	184	100
Jamestown	....	....	7	3	66	35	19	3	....	....	12	15	....	....	3	4	56	33
Kingston	....	2	2	3	8	33	....	....	....	....	9	6	....	....	....	6	8	22
Little Falls	13	1	4	6	95	29	....	4	....	....	7	17	....	4	2	7	77	16
Middletown	2	2	1	5	221	178	....	....	....	....	8	15	....	....	2	....	93	97
New Rochelle	3	3	8	5	78	120	105	5	1	....	14	27	1	1	14	15	27	33
Niagara Falls	40	12	44	8	431	120	193	42	11	....	26	94	....	5	44	72	227	60
North Tonawanda	4	....	15	2	96	23	19	....	....	....	12	19	2	....	5	2	90	21
Oswego	....	....	19	8	191	41	15	2	....	....	8	13	....	....	2	4	131	32
Plattsburg	....	....	2	....	9	5	7	....	....	....	2	1	....	....	2	....	9	5
Port Chester	....	....	8	13	184	88	436	64	....	....	7	21	....	....	4	21	84	33
Poughkeepsie	7	2	20	11	336	277	18	12	....	....	43	77	....	....	15	27	93	61

Rochester Baden Street Dispensary	....	....	46	16	1,692	1,261	234	42	....	....	96	141	2	2	104	7	949	692
Rochester General Hospital	10	13	38	36	1,077	1,021	8	46	....	....	94	105	....	....	4	1	594	492
Rochester Hahnemann Hospital	4	3	3	2	296	160	....	....	....	....	3	2	....	....	....	....	33	14
Rochester Health Bureau	....	....	320	98	....	....	....	....	....	....	37	148	4	2	17	14	....	....
Rochester Homeopathic	7	5	8	11	307	228	6	....	....	....	16	34	....	....	3	2	111	49
Rome	6	3	34	5	303	110	194	22	2	....	28	65	....	....	6	14	180	56
Schenectady Health Center	....	....	49	14	230	92	101	57	....	....	25	29	....	....	15	17	62	32
Syracuse Noxon Street Dispensary	....	1	....	13	....	38	....	416	....	....	15	37	....	....	4	57	....	8
Syracuse Free Dispensary	88	45	306	78	1,061	694	1,166	24	22	....	107	209	....	....	64	77	257	192
Troy Municipal Clinic	....	....	28	21	138	200	190	24	....	....	16	29	....	....	15	11	105	11
Utica	56	46	101	39	762	527	987	207	....	....	63	143	....	....	67	44	222	195
Yonkers	1	1	93	24	942	423	386	10	1	....	34	87	....	....	30	58	278	123
White Plains	....	....	....	2	21	43	....	....	....	....	6	8	....	....	....	....	9	21
Albany House of Good Shepherd	....	25	....	8	....	94	....	290	....	....	10	21	....	....	3	20	....	19
Troy House of Good Shepherd	....	....	....	70	....	464	....	....	....	....	16	75	....	....	1	25	....	90
Totals	425	256	2,496	768	15,196	9,836	13,489	2,961	193	....	1,349	2,452	19	20	1,225	1,055	7,678	4,440

TREATMENTS JULY 1 TO DECEMBER 31, 1920

	Syphilis		Gonorrhea		Chancroid		Nonvenereal		No. of Doses of Arsphenamine Administered	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Albany So. End Dispensary	247	181	92	25			1	5	131	105
Albany Hospital Dispensary	71	10	110		3		5		31	7
Amsterdam	257	197	243	31			5		157	116
Binghamton	1,239	517	464	6					700	261
Buffalo Urologic	77	49							69	45
Buffalo Municipal Hospital	271	163	1,263	1,260	96		208	193	244	129
Buffalo Health Center No. 5	3,116	1,205	6,128	91	41		1,520	16	1,842	593
Corning	79	73	29	9	9		4	2	99	77
Dunkirk	64	18	283	11	7		14		20	8
Elmira	393	303	219	72			3		247	250
Glens Falls	166	233	121				7	2	64	41
Gloversville	205	165	4						92	77
Hornell	147	171	9	10					100	121
Ithaca	320	253	440	176			8		184	100
Jamestown	66	35	19	3					56	33
Kingston	8	33							8	22
Little Falls	95	29		4					77	16
Middletown	221	178							93	97
New Rochelle	78	120	105	5	1		6	1	27	33
Niagara Falls	431	120	193	42	11		132	37	227	60
North Tonawanda	96	22	19				27	1	90	21
Oswego	191	41	15	2			13	8	134	32
Plattsburg	9	5	7						9	5
Port Chester	184	88	436	64			2	10	84	33
Poughkeepsie	336	277	18	12			3	3	93	64
Rochester Baden St. Disp.	1,692	1,261	234	42					949	692
Rochester General Hospital	1,077	1,021	8	46					594	492
Rochester Hahnemann	296	160							33	14
Rochester Homeopathic	307	228	6						111	49
Rome	303	110	194	22	2			6	180	56
Schenectady	230	92	101	57					62	32
Syracuse Free Dispensary	1,061	694	1,166	24	22				257	192
Troy	138	200	190	24					105	111
Utica	762	527	987	207			3	3	222	195
Yonkers	942	423	386	10	1		348	63	278	123
White Plains	21	43							9	21
Albany House of Good Shepherd		94		290						19
Troy House of Good Shepherd		464								90
Syracuse Noxon St. Disp.		38		416						8
Totals	15,196	9,841	13,489	2,961	193		2,309	350	7,678	4,440

Another method of determining what a clinic has meant to a community is to learn what proportion of the population made use of its services. The table following gives such data.

Portion of population registering at clinics for either treatment or advice from July 1, 1920 to December 31, 1920

Cities	Population	Number persons registering	Rate per thousand
1 — Hornell	15,242	85	5.56
2 — Ithaca	17,344	78	4.50
3 — North Tonawanda	16,027	57	3.52
4 — Rome	27,244	84	3.08
5 — Binghamton	69,269	212	3.06
6 — Utica	97,205	280	2.88
7 — Glens Falls	16,853	48	2.83
8 — Buffalo	519,608	1,403	2.70
Niagara Falls	53,899	145	2.70
9 — Corning	16,143	43	2.66
10 — Port Chester	17,154	45	2.62
11 — Elmira	46,662	120	2.57
12 — Rochester	306,167	731	2.38
13 — Gloversville	22,296	52	2.30
14 — Syracuse	177,042	347	1.96
15 — Poughkeepsie	36,091	70	1.94
16 — Yonkers	103,324	177	1.71
17 — New Rochelle	37,348	57	1.53
Dunkirk	19,663	30	1.53
18 — Little Falls	13,146	16	1.22
19 — Troy	71,271	85	1.19
20 — Oswego	23,666	23	0.97
21 — Middletown	18,900	18	0.95
22 — White Plains	21,640	20	0.92
23 — Schenectady	91,179	63	0.69
24 — Amsterdam	33,873	23	0.68
25 — Kingston	26,809	17	0.63
26 — Jamestown	40,094	19	0.48
27 — Albany	115,366	54	0.47
28 — Plattsburg	10,874	5	0.46

White Plains clinic was first opened in September and Plattsburg clinic in October.

The clinic depends for its growth and development upon five tangible factors:

(First) *The medical profession.* The physican in charge must be qualified by disposition and character to do public health work, to command the respect and confidence of patients at the first visit. He must diligently endeavor to inspire them with his interest in their case. He must be able to cooperate with the other practitioners of the community because as is shown by the table on page 64 many new cases are referred to the clinic by practicing physicians.

(Second) *The clinic or follow-up nurse.* She it is who by conversation with the patient learns of the source of infection, contacts and other possible cases and who can tactfully bring them to the clinic.

(Third) *Newspaper advertisements.* A carefully worded announcement of the location and treatment hours of the clinic inserted in the newspapers either in the news columns or on the sporting page has been found of value in extending the services of the clinic.

(Fourth) *Testimony of patients.* Not a few persons learn of the clinic and are persuaded to seek it either for advice or treatment because of the recommendation of a friend who is a patient.

(Fifth) *Cooperation of police and city courts.* All vagrants, male and female, (Article XVII-B, Section 343-N) must be examined before being granted their liberty and the courts find the clinics convenient for enforcing this measure.

In the preceding table these influences have been proportionately active in the city according to its ranking. In the three leading cities the clinic physicians have either personally or through the follow-up agency canvassed every physician in the community and explained clearly the manner of conducting the clinic and the desire of the management to have it serve the community. The physicians have shown great willingness to cooperate when they were assured that patients referred to the clinics for specific treatment would not be lost to them otherwise.

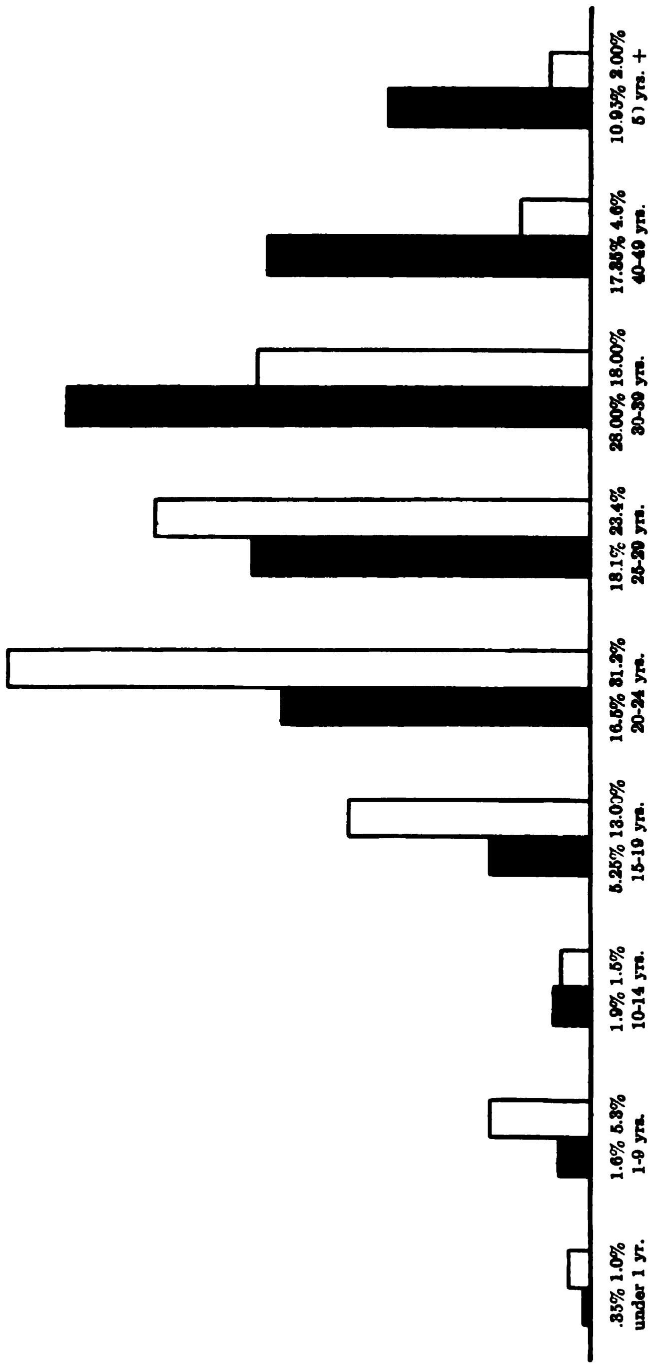
RELATION OF TREATMENTS ACCORDING TO DISEASE

Chart Showing Distribution of Treatments Given at Clinics July 1, 1920 to December 31, 1920

SYPHILIS AND GONORRHEA

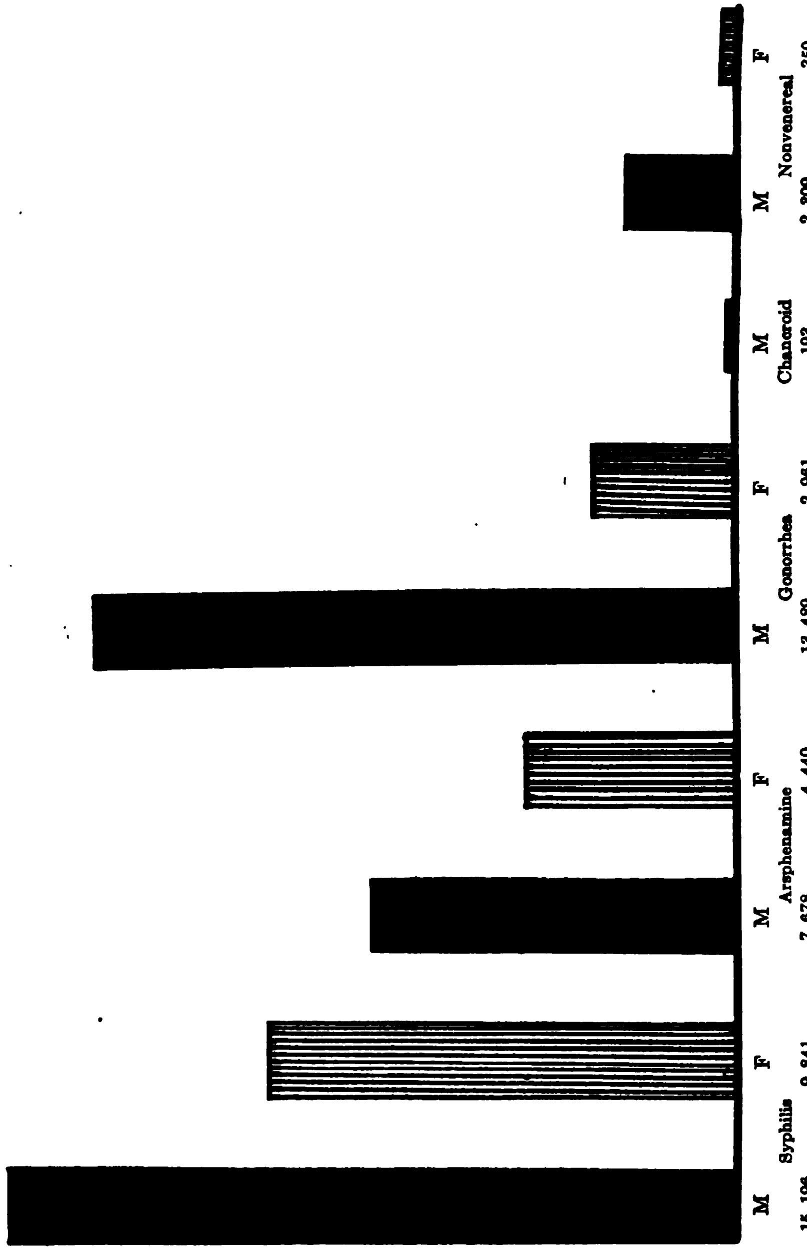
Percentage of Cases Reported at Specific Ages

Legend — Black = Syphilis; White = Gonorrhea



See page 53, Table IV

RELATION OF TREATMENTS ACCORDING TO SEX



Relation, According to Sex, of Treatments Administered at the Clinics Between July 1, 1920 and December 31, 1920

Arsphenamine Distributed to Clinics During Year 1920

Albany Hospital	47.6
South End Dispensary	136
Amsterdam	223.6
Binghamton	741.6
Buffalo, Municipal	300
Buffalo, Urologic	2,120
Corning	309
Dunkirk	24
Elmira	262
Glens Falls	80.4
Gloversville	208.2
Hornell	230
Ithaca	99.6
Jamestown	96
Kingston	26.4
Little Falls	101
Middletown	120
New Rochelle	32
Niagara Falls	221.4
North Tonawanda	28.8
Oswego	111.6
Plattsburg	7.2
Port Chester	72.4
Poughkeepsie	164.4
Rochester, Baden St.	1,000
Rochester	2,042
Rome	240
Schenectady	106
Syracuse	350.8
Troy	383.6
Utica	292.8
White Plains	21.6
Yonkers	381.8
Total grams	10,580.8

Use of the Laboratory:

The diagnosis of any of the venereal diseases requires confirmation by examination of proper body specimens by laboratory methods, perhaps, more than any other communicable disease. Recognizing the importance of having such examination and the necessity for its thoroughness and accuracy a stipulation was made in the Sanitary Code, Chapter 2, Regulation 2-a, which is quoted:

> "Regulation 2-a. Submitting specimens for laboratory examination in cases of syphilis, gonorrhea and chancroid. It shall be the duty of every physician to submit promptly to the laboratory of the state department of health, or to a laboratory approved by the state commissioner of health for this purpose, such specimens for laboratory examination and such data relating thereto, as may be prescribed in the special rules and regulations issued by the state commissioner of health, from every person affected with any one of the communicable diseases mentioned in regulation 1, group B, or from any person in whom suspicion of such diseases exists."

In accordance with Article 3, Section 25, it is required that every laboratory making examination of specimens submitted for the determination of syphilis or gonorrhea shall submit to the health officer of the district from which the specimen came as well as to the health officer of the district in which the laboratory is located, the information accompanying those specimens which "disclose the existence of a case of infectious and contagious or

communicable disease." It has been requested by the commissioner of health that the laboratories also send for statistical purposes a duplicate of this information sheet to him. It is in this way that the division has been able to collect some statistics on the prevalence of syphilis and gonorrhea.

In addition to the laboratories all of the clinics are equipped with a microscope and facilities for examining smears from gonorrhea patients and, by means of the dark field, exudate from syphilitic lesions.

Outfits for submitting specimens to a public health laboratory may be secured by the physician from the health officer of his district who is supplied by the State Laboratory. The outfit for submitting specimens of gonorrheal discharges consists of two glass slides and an information blank. The outfit for submitting blood for the complement fixation (Wassermann) test consists of a sterilized glass tube enclosing a sterile needle, enclosed in two tin mailing tubes. An information sheet is included as part of the equipment. Copies of both of these information sheets are appended. It is not feasible to submit specimens for dark field examination except by sending the patient himself to the laboratory where the specimens can be taken first hand. For reporting the examinations on these specimens an information sheet similar to the one accompanying a blood specimen outfit is used. It is required of the physician that in submitting a specimen a minimum of information must accompany the specimen which must consist of the name, age, sex, marital condition, address and occupation of the patient, clinical diagnosis, source and date of infection. Unless this information accompanies the specimen the result of the examination may not be forwarded to the physician.

Information sheet which accompanies the blood specimens submitted to the Laboratories, a copy of which filled in duplicate is employed in reporting positive cases of syphilis to the Division.

SYPHILIS

EXAMINATION OF BLOOD SERUM

See directions for collecting blood on other side

Numbers of specimen, 1, 2, 3, 4, 5, 6, 7, 8, 9, etc............................
Results of previous examinations........................Date................
Results of examinations, T. pallidum..
Date of taking blood..........................Time..................
Name of patient...................................Age........Sex........
Address ....Color ....
Occupation ....Infected by whom........................
Married ....Single .... Wid ....Children ....
Type of infection: Hereditary ....Acquired ....Date ....
Initial lesion ....Treatment ....
Clinical signs: Chancre ....Rash ....Enlarged glands ....
Duration of disease ....
Has arsphenamine been administered?..............Dates ....
Has mercury been administered?...................Dates ....
Has patient taken alcohol within 24 hours?.................................
Is marriage contemplated?
Remarks:
Is gonococcus complement-fixation test desired?

Name and address of physician Name and address of health officer

....
....
....

Physicians and health officers are requested to answer all questions on the blank up to this point and return it with the specimen.

Laboratory number..................Day number............................
Received........................Examined ....
Results of examination.................Examiner ....
....

Laboratory making examination

Information sheet which accompanies the blood specimens submitted to the Laboratories a copy of which filled in duplicate is employed in reporting cases of gonorrhea to the Division.

GONORRHEA

EXAMINATION OF DISCHARGE OR BLOOD SERUM

See directions for collecting blood on other side

Numbers of specimen, 1, 2, 3, 4, 5, 6, 7, 8, 9, etc.............................
Results of previous examinations........................Date................
Specimen from urethra......Cervix uteri......Prostatic fluid...... Blood......
Date of collecting specimen..............................Time...................
Name of patient..Age................
Address ....Sex................
Occupation ....Color.................
Married ....Single ....Wid. ....Children ....
When contracted ....Date first symptom................
Duration of disease.......................Number reinfections...............
Stage of the disease: Acute......................Chronic...................
Amount discharge ....Character.................
Treatment ....
Is marriage contemplated?
Remarks ....
Name and address of physician Name and address of health officer
....
....
....

Physicians and health officers are requested to answer all questions on the blank up to this point and return it with the specimen.

Laboratory number...................Day number............................
Received............................Examined ....
Results of examination.................Examiner ....
....

Laboratory making examination

Reports of Cases of Venereal Diseases

During the year 1920 there were reported from the laboratories and physicians of the State, the clinics not included, a total of 28,195 cases of syphilis and 7,598 cases of gonorrhea. Excluding New York City there were reported from up-state alone, 9,281 cases of syphilis and 3,277 cases of gonorrhea. Although these were first reports of these cases it must not be inferred that they were therefore recent infections. A table has been prepared to show that a large percentage were infections of long standing. To avoid a possible duplication reports from the clinics are not included because all cases registered at the clinics have not been reported by individual cards and it is therefore impossible for us to determine whether any of them have been reported by laboratory examination. Those clinics immediately under the supervision of this Division admitted to treatment during the year 2,527 cases of syphilis and 2,000 cases of gonorrhea.

The laboratory reports rarely mention chancroid while the clinics in the larger cities have reported some cases. This is due to the method of examination. If a patient with a suspicious sore retains a negative blood report the laboratory will not be able to do more than report its negative findings while the clinic physician can make his diagnosis from clinical observation or from stained preparation studied under the microscope of the clinic. The practitioner on the other hand rarely submits preparations from the discharge of open sores and if the blood examination is negative he treats the patient for chancroid but makes no report to the department of its existence. Thus for the present almost all of our chancroid reports will come from the clinics.

During 1920 there were received from: Laboratories, 3 reports of chancroid; clinics, 86 reports of chancroid.

A brief study of the information received with the reports of cases will be undertaken in the succeeding tables. Reports from New York City are not included because those records are not filed in this office. The physician submitting a specimen to the laboratory is required to submit at the same time the following data: Name, address, age, occupation, color, sex, and marital condition of patient. Opportunity is afforded on card to note other

items but such notation will be entirely voluntary. The physician hardly finds time to supply the required information and only when submitting specimens from unusual cases does he take the time necessary for submitting additional data.

The reports classified according to the items mentioned above are shown in the following table:

TABLE I

Number and per cent of venereal reports January 1, 1920, to December 31, 1920

Item of information	Number	Per cent of total
Total	12,558	100.0
Sex	12,558	100.0
Color	12,558	100.0
Distribution	12,558	100.0
Age	12,219	97.5
Conjugal condition	11,983	95.5
Stage of disease	7,816	62.2

All of the reports gave definite information as to color, sex, occupation and distribution. A few cards received in the early part of the year were not complete and later such cards were not accepted until correctly made out. The number of reports received on colored patients were so few (syphilis 385; gonorrhea 37) that no attempt has been made to keep them separate and in succeeding tables they are included in all figures.

The distribution according to sex and disease is shown in Table II.

TABLE II

Number and per cent of venereal disease cases reported by sex and disease

Disease	Number			Per cent of total		
	Both sexes	Male	Female	Both sexes	Male	Female
Total	12,558	8,540	4,018	100.0	100.0	100.0
Syphilis	9,281	6,023	3,258	74.0	70.5	81.0
Gonorrhea	3,277	2,517	760	26.0	29.5	19.0

Again it must be recalled that these reports are all results of laboratory examinations. Therefore there is hardly a possibility of the numbers being too large but on the contrary it is not improbable that in some instances too few specimens were submitted to establish the presence of the disease. It will be seen from this table that the syphilis reports outnumber the gonorrhea reports almost three to one. This relationship can be explained in part by the difficulty with which the diseases can be diagnosed from clinical examination. Since syphilis by its symptoms may duplicate such a variety of diseases while gonorrhea, when its symptoms are troublesome, generally admits of ready diagnosis, it is quite evident that the clinician will call upon the laboratory to confirm his diagnosis many more times in cases of syphilis. Our methods of diagnosing chronic or long standing syphilis are far more effective than for chronic gonorrhea and without doubt this too contributes to the recorded difference.

The fact that these figures are based entirely upon laboratory reports must be borne in mind also when studying the distribution of the diseases. Our public health laboratories are distributed very generally over the state and diagnostic facilities are within twenty-four hours' reach of every physician; but as may be suspected the laboratories are always located in cities and the nearby physicians will make the most use of them. The rural practitioner finds it much more difficult to submit his specimens and far less interesting because he lacks the opportunity to discuss with the bacteriologist the reported findings. Then too, by far the greater number of physicians live in the cities and venereally infected patients rarely being totally incapacitated, prefer to seek advice of city physicians if they suspect the true nature of their malady.

TABLE III

Distribution of venereal disease cases as to residence of patient and disease

Residence	Number Syphilis	Number Gonorrhea	Per cent Syphilis	Per cent Gonorrhea
Total	9,281	3,277	100.0	100.0
Urban	7,310	2,646	79.0	80.8
Rural	1,916	609	20.4	18.5
Out of State	55	22	0.6	0.7

A few reports were accepted in the early part of the year with an occasional item of information missing. Three hundred and thirty-nine cards (201 syphilis and 138 gonorrhea) did not state the age of the patient. In preparing the next table it was not possible to separate the congenitally infected cases from the acquired. This would be an interesting item of information but our data as to the source of infection is too incomplete to admit of charting.

TABLE IV

Distribution of venereal cases into groups according to disease and age of patient at time of submission of first positive specimen

Age Group	Number Syphilis	Number Gonorrhea	Per cent Syphilis	Per cent Gonorrhea
Total cases	9,080	3,131	100.0	100.0
Under 1 year	29	34	0.35	1.00
1 — 9 years	145	166	1.60	5.30
10 — 14 years	170	47	1.90	1.50
15 — 19 years	477	406	5.25	13.00
20 — 24 years	1,494	976	16.50	31.20
25 — 29 years	1,648	733	18.10	23.40
30 — 39 years	2,547	563	28.00	18.00
40 — 49 years	1,575	148	17.35	4.60
50 years	994	66	10.95	2.00

It will be observed that the highest number of reports for gonorrhea is reached at an earlier age group than for syphilis. This is probably not an indication of an earlier infection with gonorrhea and later syphilis but more likely due to the fact that the early symptoms of gonorrhea are more acute and the patient seeks immediate advice while the syphilitic patient may experience no inconvenience or anxiety until the rash or even later symptoms appear. This assumption is borne out by a study of the condition of the disease when the first specimen was submitted which is made in the following table.

TABLE V

Distribution of cases as to stage of disease when specimen was taken

Stage	Number Syphilis	Number Gonorrhea	Per cent Syphilis	Per cent Gonorrhea
Total cases	5,601	2,215	100.0	100.0
Acute	2,020	1,820	36.0	82.0
Chronic	3,581	395	64.0	18.0

For the purpose of this table an arbitrary distinction was made in this office between acute and chronic stages. A case of gonorrhea is considered to be chronic when the date of the submission of specimen was more than six months after the admitted date of infection or appearance of first symptoms, and a case of syphilis is considered chronic when more than one year has elapsed between the date of infection and the submission of the specimen recorded.

The observation made above concerning the promptness with which medical advice is sought in infections with gonorrhea may in part account for the greater proportion of gonorrhea cases being reported from unmarried persons.

Another table has been prepared to show the length of time elapsed between the date of infection and the submission of the first specimen. It is only fair to say that not a few cases are discovered by accident and had

it not been that some other cause brought the patient under medical examination the case would have remained a longer time undiscovered. The adoption by hospitals of the practice of making a complement fixation test of the blood serum a part of the routine examination given patients when admitted to the hospital will increase the number of unexpected discoveries.

TABLE VI

Distribution of cases as to the conjugal state of the patient at the time of the submission of the specimen

Conjugal State	Number		Per cent	
	Syphilis	Gonorrhea	Syphilis	Gonorrhea
Total cases	8,928	3,055	100.00	100.00
Single	3,710	2,143	41.60	70.22
Married	4,737	833	53.00	27.20
Widowed	415	70	4.65	2.29
Divorced	66	9	.75	.29

TABLE VII

Distribution of venereal disease cases with particular reference to the interval of time elapsing between the date of possible infection and that of the submission of the first specimen to one of the public health laboratories of the State

Time Interval	Number		Per cent	
	Syphilis	Gonorrhea	Syphilis	Gonorrhea
Total cases	4,209	1,967	100.00	100.00
Under 1 year	1,560	1,752	37.00	89.20
Under 2 years	405	101	9.60	5.10
Under 3 years	393	47	9.35	2.35
Under 4 years	243	18	5.75	0.90
Under 5 years	187	9	4.43	0.45
Between 5 and 9 years	522	24	12.35	1.20
Between 10 and 14 years	439	11	10.40	0.55
Between 15 and 19 years	192	3	4.55	0.15
Between 20 and 29 years	203	2	4.80	0.10
Between 30 and 39 years	59	0	1.40	0.00
40 years and above	6	0	.14	0.00

Of course it is possible that the presence of the disease in some instances was known before the submission of a specimen to our laboratories. Specimens may have been examined at private laboratories or sent out of the State for examination. It is also possible that there are instances where the case has been diagnosed clinically and treated for some time and the first specimen was sent to confirm therapeutic efficiency. These conditions can not be determined from our records but we do have data enabling us to determine how many specimens are being submitted from each patient while they remain positive. This data is charted below.

TABLE VIII

Data showing distribution of positive specimens among original and re-examinations for each disease

Order of submitted positive specimens	Number Syphilis	Number Gonorrhea	Per cent Syphilis	Per cent Gonorrhea
Total	11,219	3,115	100.00	100.00
First	7,267	2,680	64.75	86.00
Second	2,421	256	21.60	8.25
Third	702	81	6.25	2.60
Fourth	335	36	3.00	1.16
Fifth	171	18	1.52	0.58
Sixth	121	8	1.07	0.26
Seventh	65	7	.58	0.22
Eighth	47	12	.42	0.39
Ninth	37	7	.33	0.22
Tenth	18	3	.16	0.10
Eleventh	10	1	.09	0.03
Twelfth	9	1	.08	0.03
Thirteenth	4	0	.04	0.00
Fourteenth	12	0	.11	0.00
Fifteenth or higher	0	5	.00	0.16

Druggist Campaign

During the year druggists were visited by Dr. Guerard of the staff in a great many of the more important cities and villages of the State, exclusive of New York City. In all 745 druggists in 101 different places were visited and the druggists personally interviewed.

Although there still remains a considerable number to be visited, enough of them have been reached to warrant the drawing of certain conclusions as to the results of the educational campaign against venereal disease so far as it may have affected the druggists of the State. The visits were begun on September 1, 1919, and have been continued intermittently up to the present time. The general disposition shown by the druggists as a class was that of friendly cooperation; the welcome given was often one of extreme cordiality. The following facts were learned from the numerous interviews:

1. The average monthly sale of all venereal disease remedies, including prescriptions and proprietary or patent medicines, ranged, in money value, from nothing at all to $20.00 or more per month, the total average of all druggists visited being about $5.00 a month (estimated).

2. Not a single druggist, according to his statements, manufactured his own venereal disease remedies.

3. The number of different kinds of patent venereal disease remedies in stock was stated to be from none whatever to 8 or 10 separate varieties. Many druggists had from 1 to 3 kinds left over from the old stock but were selling none and purchasing no more. The total average in stock was about 4 kinds.

4. Every druggist without exception stated that he noticed a great decrease in the sale, and also in the demand of patent venereal disease remedies.

5. Practically everyone had signed the pledge cards sent out by the Federal Government and the State Department of Health during the war, asking that no further patent venereal disease remedies be recommended. This promise appears to have been very generally kept.

6. Each and every druggist expressed a willingness to cease the sale of venereal disease remedies entirely, if physicians will write prescriptions for such cases. Many druggists stated that comparatively few physicians in their respective districts were now treating patients by prescription. most doctors apparently being in the habit of dispensing their own venereal disease preparations and in some cases, as told the druggists by their former customers, giving out well-known patent remedies — which they felt to be at least unfair to them. This complaint was made mostly in rural districts.

7. In nearly every instance the druggist said that he would be glad to distribute literature issued by the State Department of Health to patients

inquiring for advice or remedies for venereal disease. They appeared to realize the fact that in doing this they would not only relieve themselves from a somewhat difficult situation in a perfectly legitimate way, but would be assisting also the cause of prevention by the dissemination of reliable information to those who most need it, about venereal diseases.

8. Few druggists seemed to be familiar with our literature, but on being shown copies of the different pamphlets usually chose the following for distribution: "Syphilis, Gonorrhea and Chancroid," "Facts for Young Men" and "Facts for the Adult Public." From 25 to 100 copies each of these pamphlets, by request, were accordingly mailed to them from the Albany office.

Detention Institution

Request was made of the Governor in the autumn of 1918 for one of the state institutions to be used as a hospital and detention home where girls apprehended for the first time as vagrants could be detained and treated instead of being committed to a reformatory. It was explained that there was urgent need for such an institution, first — because of the number of girls being apprehended in the vicinity of camps as camp followers and, second — because very few hospitals were equipped or willing to admit acute cases of gonorrhea and syphilis. The State Farm at Valatie, an institution established for the care of certain types of inebriates, was ordered closed and transferred to the State Department of Health for this purpose as a war measure. The institution was closed and its inmates paroled by January 1, 1919. The Division purchased an elaborate hospital equipment and was prepared to install it but did not proceed because it was discovered that authority could not be given except by the legislature to use the budget for another purpose than that for which it was originally granted. By this time, April 1919, demobilization had begun and the camp followers were no longer an emergency. No particular effort was made to continue in possession of the institution when it was learned that the legislature was inclined to appropriate it for another use. The Division recognized that although conditions were fast changing from those of a country at war to the activities of peace times there would still be need for such institution, which, in its opinion, should be called a sanatorium and provided by the State for the purpose of taking care of those persons who have no particular home or whose community is not provided with detention facilities. The larger cities have recognized the need of such temporary place of commitment or voluntary sanatorium and are providing for them.

Aid to Institutions

Staff: Dr. F. R. Sanborn, Dr. T. W. Rhodes, Miss Roberta V. Leslie, Miss Julia MacPhillips, Miss Georgia P. Cassell, Miss Faye Davidson, Miss Josephine Matthews, Miss Inez Price.

An inquiry was made of all of the hospitals (state, public and private) to know whether they made it a routine matter to secure a specimen of blood from each patient admitted and to have it examined by the complement fixation (Wassermann) method. Answers were received from only a few and these indicated that the examination was very rarely being done as a routine, but usually where some symptoms or signs suggested the presence of syphilis. Very many were performing the test on only a few of their patients. This was true of the state hospitals as well. An inquiry was then made of all state and county prisons, penitentiaries and reformatories. About 50 per cent of these were submitting blood specimens from their inmates to the State Laboratory. Since this inquiry was made other of the state hospitals have adopted the practice of making the complement fixation test of the blood for syphilis a part of the routine entrance examination of each patient and later in the year the Commissioner of the Hospital Commission requested all of the state hospitals to adopt the procedure as a part of the entrance examination given all admittants.

The state prisons, penitentiaries and reformatories that were not already making this examination of every inmate incorporated it following this request and a member of the staff was detailed to certain of the prisons and reformatories to assist in giving the first treatment to those found infected. In a few instances it was found necessary to supplement the equipment of the institution with certain pieces of apparatus before they could proceed with the treatment.

In December 1919, a proposition was submitted to all of the orphanages of the State offering to assist the physicians in charge in taking blood specimens from each of their inmates providing they would undertake to continue the work upon those entering the institution later. More than thirty institutions accepted the offer and on February 1 a physician and a nurse were detailed to the work. In addition to taking a specimen of blood a physical examination was made of each inmate and such signs and symptoms of syphilis as could be observed were noted. The physician was instructed to offer to treat those children possessing a positive blood test and accordingly a course of six intravenous injections of arsphenamine at weekly intervals with intramuscular injections of mercury was administered to every child showing a positive test for syphilis. In July 1920, it was found necessary to employ a second physician and nurse to assist with the work because the offer in the meantime had been extended to the tuberculosis hospitals. The work has not been completed, other institutions having made request for similar assistance. While it is still too early to make a complete report of the work a few remarks may be advanced. More than one thousand children ranging in age between three and eighteen years have been tested and less than 2 per cent of these gave a positive reaction for syphilis to the single blood test. Physical examination did not add any others to this list and in fact rarely pointed to the cases discovered by the blood test. It would appear that no great dependence can be placed on physical examination to discover more than a minimum number of congenital syphilitics.

Summary

Institutions visited	Number	Number specimens taken	Number positives	Number doubtful
Orphanages	35	11,045	118	263
Tuberculous hospitals	7	451	16	....
State hospital	1	220	15	....
Total	43	11,716	149	263

Number of physical examinations made, 565.

An extension of this institutional work by searching for infected contacts was undertaken in conjunction with the authorities of the State Hospital at Ward's Island. Two nurses were instructed to visit the homes of those persons entered at the hospital with paresis, locomotor ataxia or neurosyphilis for the purpose of interviewing the relatives and persuading them to undergo a medical examination, including examination of the blood. It was explained that their relative in the hospital has a contagious disease and that they, being of the same family, may be infected. This work is not completed but a preliminary report presented before the hospital association in Buffalo contained the following statistics:

Number of hospital cases investigated	75
Number of relatives in the 75 family groups	254
Number of relatives examined	82
Number of cases of syphilis found by examination	24
Number of cases of syphilis established in 254 relatives	50

As was stated in the report it was too early to draw conclusions from the figures presented, yet they are large enough to be appalling. In 75 family groups there are 329 individuals, 157 of these were examined by the hospital authorities and 99 were found to be definitely infected with syphilis. Of the

remaining 172, forty-nine had died prior to the survey, whether infected with syphilis or not is unknown, but information is available showing that at least 26 other cases exist among the 123 living relatives who had not yet been brought to the hospital for examination.

The facts brought out by the above survey suggested that a similar piece of work might be undertaken in connection with that being done at the orphanages. Here, in a measure, the conditions were reversed and accordingly more difficult. It was the breaking up of the home in most instances that gave the occasion for entering the child to the orphanage. Then, too, one could not expect to get an examination of any except the relatives of the infected and this number was too small to be of value. However, it was observed that the Laboratory was reporting an unusually large number of "doubtful" reactions on specimens submitted from these institutional children. Even repeated tests did not clear these up and place them definitely in the positive or negative groups. It was decided to make a survey of the relatives and remnants of families of these children with "doubtful" reactions. The survey is not completed as yet but a brief preliminary report will be included in this report. As was outlined above, the specimens from the children were all taken by the two physicians on this staff and examined by the state Laboratory at Albany. The specimens from their relatives were examined either by the State laboratory, the New York City laboratory or by the laboratory at the Skin and Cancer Hospital in New York City.

	Positive	Doubtful
Number of cases investigated	14	263
Family groups represented	12	173
Relatives interviewed	32	315
Relatives not interviewed	14	198
Family groups from which examinations were made	6	106
Relatives tested	11	173
Positive cases found	9	23

No record was made of the members of these families that were dead or the disease causing death. Relatives here are understood to be fathers, mothers, brothers and sisters only. The survey of the 12 families from which 14 positive children came disclosed the fact that 9 out of 11 examined were frankly positive, in other words in 12 families consisting of 60 individuals, 25 were examined and 23 found infected. A further investigation may result in showing others infected but if it should not it is still quite plain that families where a case of congenital syphilis is found should be studied very carefully for more cases.

It will be observed that 23 frankly positive cases were found among 173 relatives of those children showing doubtful reactions to the test of their blood. A further analysis of these 173 relatives follows:

Fathers examined	48
Fathers examined found positive	7 or 14%
Mothers examined	58
Mothers examined found positive	14 or 24%
Brothers and sisters examined	67
Brothers and sisters examined found positive	2 or 3%
Total number examined	173
Total number examined found positive	23 or 13%

It is conceivable that not all of the positives were found, since no other measure was taken than to examine the blood and then only one specimen. Although the work is not completed several important questions are forming themselves which will demand future investigation; namely: — Did the "doubtful" result of the blood examination have any significance? Was the blood test ever positive in these children and will it become positive later in life? Do these children have syphilis and should they be treated?

Social or Community Work

Staff: Mrs. Edith J. Mitchell, Mrs. Florence C. Cote, Mrs. G. Shafer Doyle, Miss Beatrice Pendell, Mrs. Anne Compton, Miss Lucy A. Bassett, Mrs. Henry A. MacGruer, Mr. Gordon A. Holder.

The program outlined by this Division for the control of venereal diseases took cognizance of the fact that physicians have always reported that patients suffering with syphilis and gonorrhea were prone to lose interest and discontinue their treatment on the disappearance of their symptoms in spite of the fact that they were not discharged by their physicians as cured. When the disease reappeared in these patients they invariably forgot that they had discontinued on their own initiative and charged the physician with carelessness in their treatment. It is this delinquency more than anything else that has contributed to developing in the physician a lack of interest in venereal disease patients and a disinclination to treat them, or a tendency to give them only casual interest during the time in which they are willing to continue and pay their bills.

It was the influence of this attitude both on the part of the physician and patient which we feared would militate against the success of our clinics. Numerous experiments had been made to overcome this factor by clinics and physicians in other places, but none of them met with complete success. After studying some of them, namely, where the physician by his keen interest and sympathetic advice exerted a strong influence over the patient, where the nurse by tactful conversation and sympathetic interest stimulated the enthusiasm of the patient, and where the delinquent patient was returned to the clinic through the police, it was decided that we should attempt a combination of these methods with particular emphasis upon extension of the influence possessed by the physician and nurse. Agents were employed whom we called social workers and for whom we outlined work which should make them the individuals through whom the influences of the clinic should be carried to the homes and whose first duty it should be to call upon all patients in their homes or at their work who without permission of the clinic physician, absented themselves from one or more treatment periods. Considerable skepticism was manifested by physicians and nurses as to the value of work of this character and it was prophesied by certain ones that such work was not only impracticable but would result in keeping patients away from the clinic.

Recognizing the force of this opinion and appreciating our inability to find facts controverting it, we were obliged to start our extra-clinic work as an experiment. Fancying that the average patient would object to the nurse of the clinic calling upon him at his work or in his home, a certain number of women who were not nurses but who had had experience in some form of social work, were employed to cooperate with the clinic in endeavoring to keep the patients in attendance upon their treatments until discharged by the clinic physician. For want of a better name these agents were called social workers. This, it was later discovered was an unfortunate term because while their work might be likened to certain social work, it nevertheless was really medical follow-up work since no effort was made by the agents at any time to discover the economic condition of the family or more of its social relations than its disease contacts from a medical point of view.

It was not found to be so difficult, as it had been pictured, to call upon the patient at his home or work, and what is even more surprising, in many instances the visit was heartily welcomed by the patient. When the visit was to the home, and particularly is this true of women, opportunity was afforded for a discussion of their condition with the result that the patient obtained a more satisfactory idea of the disease affecting him or her, and also an intelligent idea of the methods to be employed in protecting other members of the family against their infection. In some instances the visits and the sympathetic advice given by the worker were so acceptable that her mission must have been the subject for discussion among the neighbors, because on succeeding visits it was not unusual for other persons either to meet her at the houses where she was calling or to stop her on the way and discuss with her questions that arose in their minds concerning the disease. Thus, it was observed that the field of these workers could be greatly extended: not only by calling upon delinquents could they return them to the clinic but by making use of their opportunity to observe other members while visiting the family they were in position to recommend examination of contacts

and give advice leading to the correction of insanitary and unhygienic family conditions.

Another observation at this stage which had its effect upon future plans, was that the patient was not opposed to the clinic nurse making these follow-up visits. It was, therefore, decided to organize a staff whose prime duty it would be to stimulate and organize follow-up and investigational work in connection with each of the clinics. A director and five assistants were selected. The State was divided into five districts and assistants placed locally over each district and the director given charge of the entire work. The program adopted for this organizational staff was considerably broader than that framed for the original staff.

In addition to the medical follow-up investigational work which was proving so valuable it was planned that these new agents should undertake some of the duties that are assigned to law enforcement agents but with the understanding that the approach should be constructive in character. The first move was to have each agent make a complete survey of those cities in which clinics were located, the investigation to cover the field according to the following outline.

Social Service Survey of Community

I. TOWN OR CITY
   1. Population — number and character
   2. Most important industries

II. INSTITUTIONS AND ORGANIZATIONS
   1. Detention houses
   2. Charity organizations
   3. Settlements
   4. Women's Clubs
   5. Civic Clubs
   6. Chamber of Commerce
   7. Courts — probation department
   8. Industrial welfare

III. RECREATION
   1. Dance halls, moving picture theatres, amusement parks, etc.
   2. Girls' clubs, classes, settlements, etc.

IV. WORK OF OTHER SOCIAL HYGIENE OR VENEREAL DISEASE ORGANIZATIONS
   1. Other hospitals and clinics treating venereal disease
   2. Educational work
   3. U. S. Interdepartmental Social Hygiene Board representative

V. CLINICS
   1. Number of cases — men and women
   2. Principal sources of cases
      (a) Referred by individuals
      (b) Referred by social agencies
      (c) Referred by Courts
   3. Records
   4. Publicity
   5. Physical conditions
   6. Personnel

VI. RECOMMENDATIONS

EXPLANATORY LETTER REGARDING SURVEY REPORT

In writing this report follow as closely as possible the paragraphs on the enclosed outline. In some instances it will be necessary to write quite an extensive paragraph on each sub-topic, but it is suggested that you not only follow the outline in writing the report, but that you place at the beginning of each paragraph your topic and sub-topic on separate lines.

I. TOWN OR CITY

(Section 1 should also include the following information with regard to other communities nearby from which patients are coming to this centre.)

1. Population — number and character — Give here the population according to the latest census report or a later estimate by the Chamber of Commerce or similar examinations. State also the character of the population. Is it residential or are there industries? What is the foreign population? Are there many negroes? Is it predominantly Protestant or Catholic?
2. Most important industries — In reporting this indicate those industries which are employing the largest number of people and state whether they are employing more men or women.

II. INSTITUTIONS AND ORGANIZATIONS

This will in some instances be an extensive report in itself. In reporting the various organizations in a community, state whether or not you have interviewed the representatives of these organizations. Whether the statement you are making regarding the agency is from a report by its own representative, or your estimate gathered from observation and from statements made by other persons in the community. In describing the Charity Organization Society for instance, give such facts as the size of the organization, the general efficiency of its workers, their cooperation with the clinics, i. e., are they in the habit of sending the families to the clinic when venereal disease is suspected? If so, is this apparent at the clinic? If not, what reason do they give for not doing so? Do they now agree to do so? Do they wish reports? Will they be helpful in encouraging the wider use of the clinic? Also in the case of women's clubs, civic clubs, and Chambers of Commerce, are they active? Do they have a standing in the community? Will they support the clinic?

III. RECREATION

1. Refers primarily to commercial recreation. State whether you consider these places well or badly conducted?
2. Refers to non-commercial recreation. Do the people interested know about the clinic?

IV. WORK OF OTHER SOCIAL HYGIENE OR VENEREAL DISEASE ORGANIZATIONS

1. Other hospitals and clinics treating venereal disease. State if possible the approximate number of cases being treated by other venereal disease clinics.
2. Educational work — Refers to any educational work done through the U. S. Public Health Service, U. S. Interdepartmental Social Hygiene Board, American Social Hygiene Association, Y. W. C. A., State Department of Health or other agencies.
3. Interdepartmental Social Hygiene Board representative.— Give the name of the representative and state whether she is working on the law enforcement end of the work or whether most of her work is done in securing the voluntary cooperation of her individual cases. Does she work with the clinic?

V. CLINICS

1. Number of cases — men and women.
2. Principal sources of cases
   (a) Referred by individuals
   (b) Referred by social agencies
   (c) Referred by courts

(If the present records of the clinic at which you are working do not show the source, state what you have done or what you could do in order to make this information available.)

3. Records — Is any social record kept other than that which appears on the medical card?
4. Publicity — Is the clinic being brought to the attention of the public? If so, how? Would you advise any other form of publicity?
5. Physical conditions — Describe the location of the room or rooms. Are there separate waiting rooms for men and women? What about heat, light, plumbing, etc. Is the clinic kept clean?
6. Personnel — Does the volume of work warrant a larger number of doctors, nurses or social workers? Have you any suggestions with regard to work not already being done by any of these?

VI. RECOMMENDATIONS

This refers not only to general recommendations with regard to the clinic as a whole, but to your program of work in this particular clinic.

The primary object of collecting this information was to inform ourselves upon the condition of those factors which we believed contributed either to the multiplication or reduction of venereal diseases in the community. In making the survey numerous points of contact had to be found and in each instance a more or less elaboration upon the general plan of the Division was given which resulted in an expression of interest and promise of more or less immediate cooperation from their organizations or units. In many instances these contacts were developed and later served us in extending our work. As an educational factor they have proven most valuable. After the completion of the survey the plan of the agent has been to stimulate through the contacts, enumerated above, such constructive measures as the local conditions indicated, for instance, advertisement and extension of facilities offered by the free clinic, stimulation of proprietors of large industries to establish suitable recreational facilities for their employees, stimulation and cooperation with local authorities in providing additional recreational facilities for the use of the community as well as effective supervision over existing places of amusement. Progress in this work is of necessity slow and difficult to evaluate.

Medical Follow-up Work:

The importance of medical follow-up work in connection with patients with diseases that are not totally incapacitating or during the period of convalescence from severe illness no longer admits of debate but there is still considerable discussion over the technique of accomplishing it. Of course the ideal scheme is for the physician personally to visit the patient in his home or at his work and discuss with him in another atmosphere than that of the dispensary the effects of his treatment and the importance of measures of prophylaxis. But this is manifestly impossible because of the time involved. It remains then for the physician to choose a representative and he can find no better than a well trained public health nurse. It cannot be too forcibly stated that special qualifications and training are required by the nurse to fit her for community work. Unerring judgment and tact are absolutely essential; she must be practical, optimistic and genial. She must be able to command the respect and confidence of her patients and their relatives or contacts. She must be trained to observe and report correctly to the physician signs and symptoms of disease in contacts. She must be able and willing to help the patient solve his individual problems of therapeusis and prophylaxis as they are affected by his home or occupation. The possession of these requirements by a nurse engaged in venereal disease follow-up work is absolutely imperative.

There are physicians who, although employing follow-up service with other diseases, question the wisdom of attempting the same with venereal diseases. As these men are persuaded to give the procedure a fair trial they are convinced of its practicability. Men or women infected with a venereal disease and convinced that they are sick and stand in need of medical

care are quite as eager to be cured as are other types of patients. To gain this cooperation, however, it is essential that the physician or nurse makes especial effort to impress the patient with the seriousness of his infection because he most likely considers his infection merely a temporary inconvenience and has been taught to believe himself completely cured when the annoying symptoms are relieved.

Time is required to develop in the patient a receptive mood to this new idea of the venereal infection. The first approach must be made in the clinic where both the nurse and physician should definitely instruct the patient as to the proper care of himself and associates and at the same time by judicious questioning learn what he knows of the source of his infection and what other persons may have been infected by him. All patients are not equally approachable and, therefore, home visits cannot be made indiscriminately. The physician should select those patients who seem most amenable to the new methods as the first to be visited. As the number of patients thus selected grows others less tractable will consent to have visits made to their homes.

The first object of the follow-up work is to retain the interest of the patient in his treatment. It follows, therefore, that all patients who absent themselves from one or more treatment periods should be visited promptly unless they have submitted a satisfactory excuse. One visit may be sufficient to convince the patient of the clinic's interest in his welfare and result in his maintaining perfect attendance subsequently while another may not yield until called upon ten or fifteen times. Experience of one nurse is shown in the following table:

13 patients................	1 visit	2 patients................	5 visits
6 patients................	2 visits	1 patient	6 visits
3 patients	3 visits	2 patients................	10 visits
4 patients................	4 visits	1 patient.................	20 visits

There is no more effective way of discovering congenital syphilis and in curbing the train of disasters so often found in syphilitic families than by the sympathetic visits and talks of the visiting nurse. Ample opportunity is given at these times to " talk it out " confidentially and this is an invaluable procedure. It is no difficult task to persuade a syphilitic mother to have blood tests made on her children. It is more difficult but not less important to have the wife of a syphilitic husband have her blood tested especially if she has had one or more interrupted pregnancies.

Analysis of the reports from these clinics in which the social records have been in use for six months or more gives the following interesting information concerning the importance of the nurse as a clinic builder. In a measure this analysis is misleading because too little credit is given the clinic nurse in every instance, for it was she who collected the statistics and she by her activity was the means of establishing contact between the clinics and most of the other factors mentioned,— as for instance, a report of death due to syphilis was the occasion for investigation of a family on the part of the nurse. A glance at the table following will show that five factors are at present most potent in building up the clinics and also indicates the possibility of developing certain of the others.

	Albany	Amsterdam	Glens Falls	Hornell	Niagara Falls	Poughkeepsie	Total
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Private physician	27.3	43.4	27.8	35.2	17.7	33.3	28.8
Clinic nurse	16.4	1.0	12.2	17.1	27.3	37.9	19.8
Advertising	5.5	30.3	22.2	22.7	8.6	1.5	15.1
Friend	14.5	14.2	18.9	1.1	19.2	......	12.6
Police	......	......	......	4.6	23.7	9.1	9.6
Health officer	12.7	......	11.1	2.3	1.0	1.5	3.7
Social agencies	......	4.1	3.3	1.1	1.0	7.6	3.0
Public health nurse	......	......	4.5	8.0	0.5	6.1	2.4
Other clinics	7.3	3.0	......	1.1	0.5	......	1.3
Spouse	......	3.0	......	1.1	1.0	......	0.8
Probation officer	......	......	......	4.6	......	......	0.7
Red cross	7.3	......	......	......	......	......	0.7
Recruiting station	5.5	......	......	......	......	......	0.5
State health department	3.5	......	......	......	......	......	0.3
Death certificates	......	......	......	......	......	3.0	0.3
Dentist	......	1.0	......	......	......	......	0.2
Druggist	......	......	......	1.1	......	......	0.2

Community Work:

In addition to caring for the infected there is the obligation to prevent others from being infected. Quarantining those capable of communicating the diseases is obviously not so practicable as with other communicable diseases. Syphilis and gonorrhea have been termed the "healthy diseases." It is, therefore, important that measures be taken to eliminate conditions and places that may be known to assist in their spread. To help discover such places and conditions and to assist in organizing the forces to combat them has been the program for our community workers.

Specially trained and experienced workers will require considerable time to work out this program effectively. Our efforts are all too few to embody them in a report but there is an encouraging feature to the work and that lies in the readiness with which certain communities are willing to try parts of the program. The city of Yonkers took over as a member of its health department staff the community worker whom the Division supplied one year ago. As adequately trained persons enter the field the work will grow. At present it is being developed in many sections by the public health nurse with what time she can spare from her already too large field.

There remains to be mentioned another problem, social by nature, that must be taken up by society with the medical profession and a solution devised. The infected servant, the infected unmarried mother and the prostitute. They differ from each other in many ways but present much the same sort of problem to society. In some instances the solution must be left to the reformatories but until society finds a way definitely to investigate these variants to know whether they are defective or delinquent their number will not be materially reduced. Every community should provide a method for freeing itself from a condition which is essentially medical yet in the past has been considered almost entirely moral.

The following clinics are cooperating with the division and submitting monthly reports of their activities:

Venereal Disease Clinics

1. ALBANY — SOUTH END DISPENSARY (Albany County)
   Location.............................2 Ash Grove and Trinity Place
   Clinic Physician .... Dr. P. W. Harrig
   Clinic Nurse .... Miss Lola Skinkle
   Hours....Tuesday 11-12 a. m., Wednesday 7-11 p. m., Saturday 2-6 p. m.
   Health Officer .... Dr. Arthur Sautter

2. ALBANY — ALBANY HOSPITAL
   Location .... New Scotland Avenue
   Clinic Physician ....Dr. John E. Heslin
   Clinic Hours .... Wednesday and Saturday, 11 a. m. to 1 p. m.

3. **AMSTERDAM** — (Montgomery County) **Established September 26, 1919**
Location .... 22 Market Street
Clinic Physician .... Dr. Howard W. Murphy
Clinic Nurses..........Mrs. Mary A. Finnan and Miss Elizabeth Currie
Hours .... Tuesday and Friday, 8–10 p. m.; Saturday, 2–4 p. m.
Health Officer .... Dr. H. M. Hicks

4. **BEACON** — (Dutchess County) Not completely established
Location ....Highland Hospital
Clinic Physician...............................Dr. Julius E. Haight
Clinic Hours ....
Health Officer....................................Dr. C. B. Dugan

5. **BINGHAMTON** — (Broome County) Established April 1, 1919
Location ....71-73 Collier St.
Clinic Physician ....Dr. C. J. Longstreet
Clinic Nurse ....Miss Lela Bowman, R. N.
Clinic Hours..Mon. and Friday, 3-5 p. m.; Wednesday 3-5 and 7-9 p. m.
Health Officer ....Dr. C. J. Longstreet

6. **BUFFALO — HEALTH CENTER** No. 5 (Erie County)
Location ....51 Court St.
Clinic Physician..Dr. A. J. Smith
Clinic Nurse ....Mrs. E. F. Busch, Clerk
Miss McClellan, Follow-up Worker
Clinic Hours ..Daily, 3-5 and 6-8 p. m. (Except Sunday and Holidays)
Superintendent of Hospitals and Dispensaries....Dr. Walter S. Goodale
Health Officer ....Dr. F. E. Fronczak

7. **BUFFALO — UROLOGIC CLINIC, BUFFALO CITY HOSPITAL**
Location ....462 Grider St.
Clinic Physician ....Dr. J. E. Slotkin, Chief
Clinic Nurse.....................Miss Laura M. Hamilton, Registrar
Clinic Hours......Tuesday, Thursday and Saturday 3-5 and 6-8 p. m.

8. **BUFFALO — MUNICIPAL HOSPITAL**
Location ....770 East Ferry St.
Clinic Physician ....Dr. J. D. White
Clinic Nurse ....
Hours .... Daily

9. **COHOES** — (Albany County)
Location ....City Hall
Clinic Physician ....Dr. R. A. Hebert
Clinic Nurse ....Miss Genevieve T. Keefe
Hours ....Tuesday, 5-6 p. m. (women); 8-9 p. m. (men)
Health Officer ....Dr. John Archibold

10. **CORNING** — (Steuben County)
Location ....City Hall
Clinic Physician ....Dr. Frank S. Swain
Clinic Nurse ....Mrs. Nona Voorhees
Hours ....Wednesday, 3-5 and 7-9 p. m.

11. **DUNKIRK** — (Chautauqua County)
Location ....554 Deer St., Public Health Center
Clinic Physician ....Dr. John F. Foss
Clinic Nurse ....Miss V. P. Blatchley
Hours...................Tuesday and Friday, 6-7; Thursday, 4-6 p. m.
Health Officer ....Dr. G. E. Ellis

12. ELMIRA — (Chemung County)
Location.............................East Market and William Sts.
Clinic Physician...................................Dr. S. S. Piper
Clinic Nurse...............................Miss Anna M. Thompson
Hours ....Wednesday, 3:30-5 p. m.; Friday, 7-8 p. m.
Health Officer........ ....Dr. R. B. Howland

13. GENEVA — (Ontario County) Not completely established
Location...........................Municipal Building, Third Floor
Clinic Physician....................Dr. C. W. Grove, Health Officer

14. GLOVERSVILLE — (Fulton County)
Location.......................................19 West Fulton St.
Clinic Physician ....Dr. V. R. Ehle
Clinic Nurse...........................Mrs. Lillian Haines Walters
Hours...................Tuesday, 7-9:30 and Thursday, 3-5 p. m.
Health Officer.................................Dr. A. L. Johnson

15. GLENS FALLS — (Warren County)
Location.....................................City Hall, Ridge St.
Clinic Physician......................Dr. V. D. Selleck, Health Officer
Clinic Nurses............Miss Grace C. Briggs and Miss C. J. Chapman
Hours.............Monday and Thursday, 8-9 p. m.; Friday, 2-4 p. m.

16. HORNELL — (Steuben County)
Location ....108 Broadway — Health Dispensary
Clinic Physician........ ....Dr. John Conway
Clinic Nurse..............................Miss E. B. Hopkins, R. N.
Hours ....Monday, 3-5 and 7-8; Friday, 3-5 p. m.
Health Officer............ ....Dr. B. R. Wakeman

17. HUDSON — (Columbia County) Not completely established
Location .... Health Center
Clinic Physician...............................Dr. John L. Edwards
Health Officer...............................Dr. Louis Van Hoesen

18. ITHACA — (Tompkins County)
Dr. M. A. Dumond, 125 Farm St., treats venereal patients at his private office. Treatments given daily.

19. JAMESTOWN — (Chautauqua County)
Location...............Market Bldg., Roosevelt Square, 2 Forest Ave.
Clinic Physician .... Dr. C. F. Ormes
Clinic Nurse .... Miss Anderson
Hours .... Tuesday and Thursday, 7–10 p. m.
Health Officer .... Dr. J. J. Mahoney

20. KINGSTON — (Ulster County)
Location .... 271 Fair Street
Clinic Physician .... Dr. Frank A. Johnston
Clinic Nurse .... Mrs. Mary O'Neill
Clinic Hours .... Tuesday, 3–4 p. m.; 8–9 p. m.
Health Officer .... Dr. Frank A. Johnston

21. LITTLE FALLS — (Herkimer County)
Location .... Health Center, 539 Albany Street
Clinic Physician .... Dr. H. W. Vickers
Clinic Nurse...............................Mrs. G. B. Mosenthin
Clinic Hours .... Thursday, 3–5 and 8–9 p. m.
(Open every day except Saturday, 3–5 p. m.)
Health Officer .... Dr. George S. Eveleth

22. MIDDLETOWN — (Orange County)
Location .... 35 South Street
Clinic Physician...................................Dr. H. J. Shelley
Clinic Nurse .... Miss Harriet Taylor
Hours .... Tuesday and Friday, 7–9 p. m.
Health Officer .... Dr. J. L. Hanmer

23. NEW ROCHELLE — (Westchester County)
Location .... New Rochelle Hospital, Union Street
Clinic Physician .... Dr. Frank C. Oombes
Clinic Nurse .... Miss Watson
Clinic Hours — Tuesday and Friday, 8–9 p. m., men; Wednesday and Thursday 3–4 p. m., women
Health Officer .... Dr. E. H. Codding

24. NIAGARA FALLS — (Niagara County)
Location .... 598 Pine Avenue
Clinic Physician .... Dr. R. S. Barry
Clinic Nurse .... Miss M. C. Kelley
Clinic hours — Monday, 7–9 p. m.; Thursday, 7–9 p. m.; Wednesday, 3:30–4:30 p. m.
Health Officer .... Dr. W. S. Scott

25. NORTH TONAWANDA — (Niagara County)
Location .... 40 Webster Street
Clinic Physician .... Dr. H. O. Maldiner
Clinic Nurse .... Miss Helen McCarney
Clinic Hours .... Tuesday and Friday, 8:30–10:30 p. m.
Health Officer —
Dr. T. P. C. Barnard (ill) Dr. H. C. Lapp, Acting Health Officer

26. OLEAN — (Cattaraugus County)
Location .... City Hall
Clinic Physician...Dr. L. J. Atkins
Clinic Nurse .... Miss E. Geraldine Gibbons
Clinic Hours .... Saturday, 9–12 a. m.; Wednesday, 4–6 p. m.
Health Officer .... Dr. J. A. Johnson

27. OSWEGO — (Oswego County)
Location .... Oswego Hospital
Clinic Physician.....................................Dr. A. C. Calisch
Clinic Nurse .... Miss A. C. Hurley
Clinic Hours .... Monday and Friday, 3–5 p. m.; Wednesday, 8–9 p. m.
Health Officer .... Dr. J. E. Mansfield

28. PLATTSBURG — (Clinton County)
Location .... City Hall
Clinic Physician .... Dr. L. F. Schiff
Clinic Nurse .... Miss Irene F. Goddeau
Hours .... Monday, 7–9 p. m.; Thursday, 3–5 p. m.
Health Officer .... Dr. J. H. LaRocque

29. PORT CHESTER — (Westchester County)
Location .... 112 Purdy Avenue
Clinic Physician .... Dr. Wm. J. Sheehan, Health Officer
Clinic Nurse .... Miss Dearing
Clinic Hours .... Monday and Friday, 4–7:30 p. m.

30. POUGHKEEPSIE — (Dutchess County)
Location .... 24 Washington Street
Clinic Physician..................................Dr. Aaron B. Sobel
Clinic Nurse .... Miss Augusta Freeman
Hours .... Monday and Thursday, 7–9 p. m.
Health Officer .... Dr. Helen L. Palliser

31. ROCHESTER — Health Bureau Consultation Clinic (Monroe County)
Location .... 82 Chestnut Street, Rochester Health Bureau
Hours .... Monday, 3–4 and 7–8 p. m.; Thursday, 3–4 p. m.
Health Officer .... Dr. George W. Goler

32. ROCHESTER — Baden Street Dispensary
Location .... 160 Baden Street
Clinic Physician .... Dr. Homer W. Smith
Clinic Nurse ....Miss Nancy Stahl
Clinic Hours — Monday, 7–9 p. m.; Tuesday, 9–11 a. m. and 7–9 p. m.; Friday, 9–11 a. m.
Health Officer .... Dr. George W. Goler

33. ROCHESTER — General Hospital
Location .... 501 West Main Street
Clinic Physician ....Dr. W. F. Plumley
Clinic Nurse ....Miss Alice Fulmer
Clinic Hours .... Monday and Friday, 10–12; Thursday, 7 p. m.
Health Officer .... Dr. George W. Goler

34. ROCHESTER — Hahnemann Hospital
Location .... Rockingham Street
Clinic Physician ....Dr. E. Russell Sprague
Clinic Nurse ....Miss Burns
Hours .... Tuesday, 9–11 a. m. and 7:30–9 p. m.

35. ROCHESTER — Homeopathic Hospital
Location .... 224 Alexander Street
Clinic Physician .... Dr. H. S. Hotchkiss
Clinic Nurse .... Mrs. Ruth H. Backus
Clinic Hours...................Saturday, 9 a. m.; Thursday, 7 p. m.

36. ROME — (Oneida County)
Location .... 245 East Dominick Street
Clinic Physician .... Dr. R. J. Marshall
Clinic Nurse .... Miss M. Ringrose
Clinic Hours ....Monday and Thursday, 8–10 p. m.
Health Officer ....Dr. C. R. Mahady

37. SARATOGA — (Saratoga County)
Location .... Saratoga Hospital
Clinic Physicians......Dr. Frederic Resseguie and Dr. David C. Nolan
Clinic Nurse .... Miss Clothier
Health Officer, Augustus S. Downs, M. D., Dr. George Scott Towne, acting

38. SCHENECTADY — (Schenectady County)
Location .... Health Center Bldg., 508 Union Street
Clinic Physician.............................Dr. W. H. Vanderwart
Clinic Nurse .... Miss Mary Hemmerling
Clinic Hours —
Tuesday and Thursday, 7:30–8:30 p. m.; Thursday, 11–12 a. m.
Health Officer .... Dr. J. H. Collins

39. SYRACUSE FREE DISPENSARY — (Onondaga County)
Location .... 610 East Fayette Street
Clinic Physician —
Dr. O. H. Benson, Registrar; Dr. S. P. Richmond, Physician
Clinic Nurses .... Miss St. John and Miss Cornell
Clinic Hours .... Daily, 1:30–3:30 p. m.; Wednesday, 7:30 p. m.
Health Commissioner .... Dr. Henry A. MacGruer

40. SYRACUSE — Detention Hospital
Location .... 116 Noxon Street
Nurse in charge .... Miss E. Laura Matthews

41. TROY — (Rensselaer County)
Location .... Samaritan Hospital
Clinic Physician .... Dr. H. W. Carey
Clinic Nurse .... Miss Mary McLaughlin
Clinic Hours ... Monday, 5–8 p. m.; Wednesday and Friday, 9–11 a. m.
Health Officer .... Dr. M. D. Dickinson

42. UTICA — Free Dispensary (Oneida County)
Location .... 224 Mary Street
Clinic Physicians —
Dr. George Fisher (male); Dr. Angeline Martine (female)
Clinic Nurse .... Marjorie M. Waters, R. N.
Social Worker .... Miss Etta Carr
Director of Clinic .... Dr. Florence I. Staunton
Clinic Hours —
Monday, Tuesday, Wednesday, Thursday and Friday, 7–9:30 p. m.
Health Officer .... Dr. Hugh H. Shaw

43. WATERTOWN — (Jefferson County)
Patients treated in office of Dr. W. D. Pinsineault, Cleveland Building

44. WHITE PLAINS — (Westchester County)
Location .... 45 Hamilton Avenue
Clinic Physician .... Dr. H. Sherman
Clinic Nurse .... Mrs. G. F. Ackley
Clinic Hours .... Thursday, 4–5 p. m. (female); 5–6 p. m. (male)
Health Officer .... Dr. Edwin G. Ramsdell

45. YONKERS — (Westchester County)
Location .... City Hall Building
Clinic Physician .... Dr. B. H. Belcher
Clinic Nurse .... Miss Louise Landers
Social Worker .... Mrs. Helen Mitchell
Clinic Hours —
Monday night — women, children and boys under 16; Tuesday and Friday evenings, general for men; Thursday evening, salvarsan only; Wednesday afternoon, 2–4 by appointment
Health Officer .... Dr. C. W. Buckmaster

DIVISION OF LABORATORIES AND RESEARCH

DIVISION OF LABORATORIES AND RESEARCH

HERMANN M. BIGGS, M. D., *Commissioner, State Department of Health, Albany, N. Y.*

SIR.— The year 1920 has been a year of continued adjustment, reorganization and standardization among the different departments and groups of the laboratory, as well as a year of increased routine work.

Public health work everywhere has received a great impetus. Nearly five million of our men drawn into the Army or Navy have seen and learned much concerning modern methods of preventive medicine. They have returned to their homes imparting this new knowledge to their families and friends and, consequently, much more than formerly, the laboratory is now generally recognized as the foundation of all effective public health work.

The lack of laboratory facilities, however, has made the practice of medicine according to modern standards impossible in rural districts. Capable young graduates in medicine stay in cities where they can have the advantage of the best facilities, and rural communities suffer accordingly. The leaders of the profession recognize the situation as a serious menace to the public health and have actively considered remedial measures. These remedies all turn to legislative aid and follow in principle the provisions of the health center bill introduced last year by Senator Sage and Assemblyman Machold. The development of laboratory and hospital facilities throughout the State is the aim of this legislation, and nothing will contribute more toward the health and happiness of the people of the State generally than its speedy enactment. Iowa, Michigan and several other states have taken, or will soon take, steps in this direction, and the American Medical Association is now considering the advisability of a general campaign throughout the country in support of legislation based upon these principles. The Division of Laboratories and Research in its present organization, if adequately supported, is fully prepared to aid in the establishment of local laboratories anywhere in the State.

Diagnostic Laboratories

In the meanwhile, whatever new work is undertaken, or however the laboratory service is extended throughout the State, the routine procedures, for the performance of which the Division of Laboratories and Research is primarily established and maintained must go on. The standards of excellence must be kept up and, more and more, the organization within the laboratory groups perfected so that the resources at command may be applied to the best advantage. The growth in routine activities may be seen in the statistics from the diagnostic laboratories. The examinations have increased from 146,993 in 1919 to 201,531 in 1920; the distribution of diagnostic outfits from 169,109 to 190,965. In particular, a greater number of complement fixation tests for syphilis has been made during 1920 than was made in any other year for all other tests combined. The outfits for collecting specimens are expensive, and the performance of the test is expensive, but it does not seem possible to overestimate the value of these examinations in connection with public health. The large number of examinations made during 1920 is an important indication of the way in which the expenditure of appropriations has reacted in more adequate protection to life and health.

Miss Gilbert and her competent assistants deserve great credit for perfecting the organization of the diagnostic laboratories so that they could handle this large number of examinations, and especially for their loyal service during the trying period of the summer months when the staff was depleted by vacations.

Antitoxin, Serum and Vaccine Laboratories

The Antitoxin, Serum and Vaccine Laboratories show very marked increase in production and distribution of nearly all biologic and chemical preparations; this increase is especially noteworthy of diphtheria antitoxin, outfits for the Schick

test, diphtheria toxin-antitoxin mixture, bacterial vaccines and arsphenamine. Improvement in technical procedures and in organization of the work of these laboratories has gone on in conjunction with routine production, but for further progress more trained workers with a knowledge of the chemical and physiological problems connected with the production of biologic and chemical preparations are required. They cannot be secured, however, until the salaries offered more nearly approximate those in other laboratories.

The federal requirements for activities in these laboratories cannot be met without additional appropriations to provide a separate building for work with the pathogenic spore-bearing anaerobes, such as Bacillus tetani and Bacillus botulinus; new stable units for the horses; quarters for small animals; increased facilities for filtering, filling, boxing and storing materials; and sufficient staff to meet these requirements adequately. The items for new construction in the budget were requested largely, if not entirely, for the purpose of conforming to these federal standards. Nevertheless, Miss Kirkbride and her staff have succeeded in attaining the highest standards in quality despite the hazards which are taken in the preparation of products. Other states and municipalities and also several foreign countries have requested the privilege of purchasing our surplus serums. None of the therapeutic products can be sold in interstate commerce without a federal license.

Water Analysis In the laboratories for water analysis, also, an increased number of examinations was made in 1920 as compared with that of the year 1919. The laboratory has been able to help the Engineering Division in its inspection of water supplies which are dependent upon artificial methods of sterilization by making frequent examinations of samples from such supplies. This work of cooperation can and ought to be most advantageously developed.

Analytical Chemical Laboratories Besides the usual number of special examinations made by the analytical laboratories for health officers and physicians, many analyses and tests of raw materials and of finished products have been made for other departments of the laboratory. Much time and thought have also been spent by Mr. Wachter and his assistants in working out details and supervising the installation and adjustment of the larger apparatus in the laboratory.

General Service Groups In the other laboratory groups which generally serve the scientific staff — the departments preparing media and other supplies, and those recording and reporting results — in fact everywhere the increase in the activities of the scientific workers is especially reflected. Throughout the laboratory improvement in organization is apparent. Particularly, progress has been made in systematizing and correlating various phases of office and administrative management, and in improving the procedure required of those undertaking research work, the method of recording scientific papers and research work, and in bringing the resources of the library to bear more directly and effectively upon the various branches of scientific inquiry.

Organization Not Complete The organization of an institution continually growing and expanding in unforeseen directions, to say nothing of being conditioned by legislative restrictions or civil service regulations, can never be considered complete, but the foundations have been securely laid, and the work of organization within the groups, correlation of the laboratory with other divisions of the Health Department, and inspection and supervision of local laboratories go steadily forward.

Opportunities for Training Workers Exceptional opportunities are provided in the laboratory for training laboratory workers. Standard methods for the technical procedures are available, library facilities and opportunities for research are given, and arrangements have been made for those coming from a distance to familiarize themselves, for longer or shorter periods, with the work of the laboratory.

Supervision of Local Laboratories

The Division of Laboratories and Research has thus been forced to devote the major part of its resources and energy to carrying on the increased work and to perfecting its own organization, but it must now turn more and more actively to the development of local laboratories throughout the State.

Prescribed by Law

The provisions of the Public Health Law and Sanitary Code of the State, together with public sentiment and the drift of recent legislation, impose upon the Division of Laboratories and Research very definite obligations. All laboratories handling pathogenic microörganisms must register January 1, each year, with the Commissioner of Health, and his approval must be secured for the shipment or distribution of cultures of the virulent, disease-inciting microörganisms to other laboratories or to individuals. All the laboratories of the State, outside the City of Greater New York, that are engaged in public health work now operate under the supervision and control, and with the coöperation of the central laboratory in Albany. Standards of laboratory work must not only be maintained but also advanced whenever and wherever necessary.

Encouraging Results

During 1920 the work of inspection and supervision has been actively carried on with encouraging results. The number of local laboratories approved during 1920 was sixty-seven, an increase of thirty-four over the number in 1919. This means that these laboratories have brought their activities into conformity with the central laboratory standards; a fact to be emphasized. It is desirable that local laboratories, as far as possible, perform the diagnostic tests for the physicians of their respective localities.

Different Ways of Helping the Local Laboratories

Besides inspecting the local laboratories and advising the persons in charge, the central laboratory has sent out workers where for any reason there has been a shortage of help. From time to time representatives from these laboratories of the State, and also from other states, or even foreign countries, have been trained in the central laboratory. Each year several members of the staff have taken important positions in other laboratories. Thus, although only a beginning has been made, training of laboratory workers has gone hand in hand with the standardization and consolidation of all the public health laboratory work of the State, and the laboratory's sphere of influence has also been extended beyond the borders of this State.

New York State Association of Public Health Laboratories

The New York State Association of Public Health Laboratories now holds two meetings each year; one with the State Medical Society at its annual meeting, the other at the State laboratory in Albany.

Research

Research for the year has included more work than usual along immediately practical lines, namely, investigations toward the improvement of technical procedures, such as the preparation of media, the production of biologic and chemical products, and the performance of the complement fixation test. Besides, studies have been completed on the classification of the meningococcus, and the preparation of antimeningococcus serum.

Twelve papers were prepared and accepted for publication and a number of others will be ready in the near future. So far as possible the work in connection with research and investigation — the required forms for preliminary outlines, for reports of progress, and for the finished papers — has been formulated.

Not only for the effect of research upon the work of the laboratory but because many laboratory questions relating to the causes, prevention or cure of the infectious diseases are still unsettled, the laboratory is continually obliged to plan for some researches in order to determine the facts upon which action should be based.

Work of the Assistant Director

No summary, however brief, of the laboratory work for 1920 would be complete without mention of the valuable aid given by the Assistant Director, Dr. Paul B. Brooks, who has had general supervision of the various field activities, and has increased the usefulness of the laboratory service in many directions throughout the State by promoting, organizing and extending the activities of local laboratories whenever occasion offered. He has represented the laboratory at numerous official conferences, assisted during the year in connection with three courses in public health and served with the group consultation clinics held under the auspices of the Department of Health. He has cultivated generally a spirit of friendliness and cooperation on the part of health officers and other physicians who look to the main laboratory for service.

Besides these outside activities, he has taken charge of a number of routine matters and administrative duties connected with the laboratory in Albany and been active in promoting cooperation between the Division of Laboratories and Research and the other divisions of the Department.

The growth of the laboratory work as a whole and in its main departments is best seen in the summarized reports from the different departments which are appended, and in the results charted year by year, as shown on page 165. The continuous increase and the exceptionally marked increase during the past two years in the face of steadily mounting costs, with appropriations always six months to a year behind the increase in work, has forced the laboratory into a retrenchment such as Governor Miller in his message now demands of all State departments.

Early in the year an attempt was made to conserve the appropriation for equipment and supplies by holding a reserve and keeping to a monthly allowance, but despite this retrenchment, January 1, $53,306.68 had been spent, leaving a balance of $30,693.32, and thus an unavoidable minimum deficiency of $23,000. No new technical positions have been allowed and all outside supplementary funds have been devoted to providing the scientific staff with clerical and library assistance to conserve their time for their technical and scientific work. Inspection and supervision of the approved local laboratories has been temporarily dropped. The upkeep of the buildings and grounds has been reduced to a minimum, below the allowance for safety if continued. The entire staff, numbering 215, has been put on an eight-hour day instead of the usual seven-hour day of all other State departments. The stress of this situation has left the laboratory with a deficiency for supplies, and an average salary of $1,257, which when compared with the present average salary of six other State departments, $1,856, accounts for a labor turnover during 1920 of 61 per cent.

Without the loyal and able assistance of the staff and even great sacrifices on the part of many of them, it would have been utterly impossible to accomplish the tasks that have been set before us during the last two years.

The work of Dr. Brooks has relieved the director of the care of many details and made it possible for him to devote more time not only to the scientific work of the staff, but also to the larger aspects of laboratory service which are rightly demanded from the representative of a progressive state public health laboratory.

During the year the director has attended the meetings of twenty-five different associations or other gatherings, taking part or giving addresses at a number of them. He has visited laboratories and other institutions in various cities. In September he attended the meeting of the American Public Health Association on the Pacific coast, presiding as chairman of the Laboratory Section. His trip through the western states afforded an excellent opportunity of studying the difficult situation there, where a large number of private laboratories have developed without any supervision of their efficiency, and where the public health laboratory, a comparatively new institution, is developing under great difficulties. There is no standardization of laboratory work anywhere comparable to that of New York State.

The chief problem of the future is now clearly defined. Every effort should be directed toward the development of local laboratories, the establishment of new ones in inaccessible districts, the expansion of those which have been longer established and more efficient to serve larger districts, and the support of the smaller local laboratories which are continuing their work under great handicaps. The Division of Laboratories and Research, with adequate support, is now prepared to cooperate in this important work.

Respectfully submitted

AUGUSTUS WADSWORTH
Director

May 6, 1921.

Antitoxin, Serum and Vaccine Laboratories

M. B. KIRKBRIDE

During 1920 there was marked increase in the production and distribution of nearly all biologic and chemical preparations. This was accomplished with practically no increase in staff except in the group concerned with the production of arsphenamine, which previously had been on an experimental basis. Considerable progress has thus been made in standardization and more efficient organization of the work. At the same time special effort was directed toward improving the quality of the preparations through investigations carried on in conjunction with routine production.

Diphtheria and Tetanus Antitoxins

The prevalence of diphtheria in different sections of the State and the active educational campaigns carried on during the autumn by two of the largest cities developed an unprecedented demand. The distribution of diphtheria antitoxin exceeded by over thirteen million units that of 1919, when more than twice as much antitoxin was sent out as in 1918. Similarly an increase of over 100 per cent in distribution was shown in outfits for the Schick test and of 378 per cent in diphtheria toxin-antitoxin mixture.

The necessity for an ample reserve supply of all products which require weeks or even months in preparation, and for adequate facilities for their production, storage and rapid preparation for shipment, is evident. One large city asked for and received in less than four weeks more diphtheria toxin-antitoxin mixture than was sent out during the twelve months of 1919, while in November and December more than seventeen thousand packages, containing one-third of the entire year's output of diphtheria antitoxin, were distributed. Although in these instances the emergencies were successfully met, additional facilities are essential if the laboratory is to be in a position to give unfailing service and cooperation when most needed.

Fewer therapeutic doses but more of the prophylactic packages of tetanus antitoxin have been sent out. This is mainly due to a better adjustment of distribution to the actual requirements throughout the State.

Production of antitoxins and serums has been hampered in the past not only by totally inadequate accommodations for the horses, but also by the limited number of animals which could be purchased and the frequently undesirable type which was alone available. During 1920 these difficulties have in part been met; in January a gift of five actively immunized horses was received from the Rockefeller Institute, which had discontinued the production of serums. Later, through the interest and cooperation of Major Chandler seven horses were obtained from the State Constabulary at a nominal charge. Three horses were also received from the State militia as a result of the new law which permits of such transfers, and arrangements are under way for transferring ten additional animals. Though it is too soon for the final products to show the full benefit, with more choice in the selection of horses and the painstaking study now made of each during immunization, the average antitoxic content of the diphtheria horses has risen rapidly during the last six months.

Antimeningococcus, Antidysentery, Antipneumococcus Serums

Steady increase in requests for antimeningococcus serum indicates a growing appreciation of its therapeutic value by physicians. It is to be regretted, however, that their failure to supply information asked for on the report slips accompanying each package has prevented the collection of accurate statistics. Distribution in the State of antidysentery and Type I antipneumococcus serums has remained practically stationary. The apparent decrease in the latter is caused by the large amounts requisitioned by the War Department for the Army in 1918 and 1919.

Diagnostic Immune Serums

The demand from laboratories outside the State for immune serums used in diagnoses has increased rapidly. Since it is always necessary to produce a surplus for possible emergencies and easy to increase it once the horses have reached a high degree of immunity, this outlet serves the double purpose of reimbursing the state treasury and at the same time of performing a definite public service beyond the limits of the State. The extent of this service is shown by the fact that 110 laboratories in 31 states (not including New York) procured standard antipneumococcus serums during 1920. In addition 19 laboratories in 9 foreign countries — among them Africa, Brazil, China, India and Peru — were supplied with these serums. It is much to be regretted that frequent and urgent requests for the laboratory's surplus of therapeutic serums must be refused and the serums allowed to deteriorate owing to the absence of a federal license.

Bacterial Vaccines

During the year twice as many packages of combined typhoid-paratyphoid vaccine and of pertussis vaccine were distributed as in 1919. While the laboratory continues to send out the monovalent typhoid vaccine, the preparation of a separate paratyphoid vaccine has been discontinued as unnecessary.

Arsphenamine

The distribution of arsphenamine to approved clinics and institutions has increased 83 per cent. The actual production of arsphenamine by the laboratory, however, was less than had been anticipated. This was due chiefly to delay in the preparation of large batches caused by the inadequate facilities of the Yates Street laboratory, exceptionally difficult problems met with in production and constant delay in obtaining essential equipment and supplies.

In September, however, the general distribution of the laboratory product was commenced, after a year's satisfactory observation of its use in State institutions. This material is subjected to the most rigid tests before distribution. Not only must each lot conform to standards set by the State laboratory and pass the United States Public Health Service tests in Washington; it must also have been tested clinically. The output can undoubtedly be greatly increased early in 1921, but the Yates Street building will continue to be a hazard for the workers and an almost insurmountable obstacle to production.

Miscellaneous Preparations

Two thousand more small silver nitrate outfits for the prevention of ophthalmia neonatorum were distributed than in 1919. A special large container for use in hospitals or by physicians requiring the solution frequently has been added to the laboratory's supplies. A small supply of antianthrax serum was procured for emergency use. Fewer requests for antirabic vaccine have been received than for several years.

Farm

Physical conditions at the farm have grown worse rather than better during the year. This was to be expected. The roofs and floors of the old barns and stables have been patched and repaired but are neither satisfactory

nor safe for storage of crops or accommodation of animals. Highly immunized and productive horses are constantly subjected to possibility of injury because there are not enough stalls. The prevailing wages for farm and other labor made it impossible to get or hold the minimum staff required. The average for the year — exclusive of Mr. Schadler — was approximately 5.7 men. It is therefore remarkable that besides the care and immunization of about forty horses, which entailed more than 2,400 injections and nearly 900 trial and whole bleedings, the value of the crops raised is roughly $8,000. This is the same as last year but actually represents a marked increase in production owing to the present drop in prices. In addition it is estimated that small laboratory animals valued at $2,000 were bred at the farm and Yates Street laboratory. If adequate quarters and care were provided the number of animals raised, could be much larger, which should give better and more economical service to the laboratory than is now possible when it must depend to a large extent on outside dealers.

Pneumococcus Type Differentiation

This diagnostic procedure was first undertaken by the laboratory in 1915 in conjunction with the production of antipneumococcus serum and the work has remained in the antitoxin, serum and vaccine laboratories since that time. It will be transferred to the diagnostic laboratories early in 1921. Last winter many specimens from State institutions were examined in connection with the United States Public Health Service investigation of the preventive value of polyvalent pneumococcus vaccine, in which study this laboratory took an active part. Mrs. Botsford, who had been in charge of the work here, was released to accept a federal position at the Willard State Hospital, where an intensive study was made while specimens from the other institutions were examined here and at the Branch Laboratory in New York city.

Special Investigations

Bacteriological investigations of foodstuffs in connection with several suspected cases of food poisoning were made. Fourteen samples of hair bristles used in shaving brushes were examined and B. anthracis isolated from two. Various studies connected with improvement in technical procedures, development of methods for hydrogen ion estimations, etc., were also carried on.

Staff and Future Work

More efficient work has been possible during the year as a result of the fine team-work and zeal of the heads of groups and their assistants. When, however, among an average staff in 1920 of about forty-five, thirty-two resignations, transfers and dismissals, and twenty-eight appointments have occurred, a thoroughly efficient organization cannot be developed. A permanent staff and more workers with a thorough chemical and physiological training are needed. The products used in serum and chemo-therapy are still imperfect. Practical studies should be concentrated upon such as that already in progress on the further purification and concentration of antitoxic serums in order to reduce or eliminate the distressing serum rashes and reactions not infrequently occurring after injection of antitoxin.

While in the new laboratory facilities are enormously increased, the conditions under which the various curative and preventive products are prepared still fall far below the minimum federal requirements on account of overcrowding. These should be met by providing (1) a special building for work with pathogenic spore-bearing anaerobes (B. tetani, B. botulinus, etc.) (2) new stable units, (3) quarters for small animals, (4) increased facilities for filtration, filling, boxing and storing of materials, (5) sufficient staff to meet these requirements adequately.

Report of the Diagnostic Laboratories

RUTH GILBERT

The following report summarizes the activities in the diagnostic department during 1920. It shows the increase or decrease in work, the new methods employed, the ways in which the central laboratory has cooperated with other laboratories and also outlines some of the investigations undertaken by members of the diagnostic department.

The number of specimens received for the complement fixation test for syphilis and for miscellaneous and cultural examinations for enteric diseases, has markedly increased, while the number for the agglutination test for typhoid and for tubercle bacilli has remained practically the same as for 1919. Fewer specimens were sent to be examined for gonococci and diphtheria bacilli. The total number of specimens for the year, however, shows a decided increase.

During the past year we have been compiling the monthly statistical reports from the accession book. In making reports in this way we are able to compute readily the number of examinations made on each specimen and to check our results with the serial number.

Recently we have undertaken the listing of results of specimens taken as a routine in institutions and schools when large numbers of specimens are received at one time, thus saving considerable time in making out individual reports.

This year we have sent Keidel blood culture outfits to physicians requesting containers for this purpose. These outfits seem to be very satisfactory.

The heavy demand for virulence tests seems to indicate that physicians appreciate their value, and realize since few of the local laboratories make the test, that specimens must be sent to the State Laboratory. The majority of the specimens came from institutions or schools where throat cultures were taken as a routine.

As a result of the special investigations made throughout the year by the Division of Venereal Diseases, large numbers of specimens were sent to the laboratory for the complement fixation test for syphilis, taken chiefly from institutions for children and young people. Among these specimens a small percentage of positives was found.

Specimens of sputum to be tested for the presence of tubercle bacilli are now heated as a matter of routine procedure before being examined. By this treatment the danger to persons handling the specimens is lessened, and the sputum is in better condition to be concentrated by centrifugalization so that in doubtful cases the chances of finding the organisms are increased.

From the routine examinations that have been made several interesting cultures for study have been obtained. A culture of B. dysenteriae of the Shiga type was isolated from a specimen of feces. The physician sending the specimen reported that the symptoms of the patient were similar to those of several patients who had died.

An unusually interesting culture, isolated from water, was received from another laboratory. A number of persons who used the water from which this culture was isolated had clinical symptoms of typhoid fever. The culture was motile, liquefied gelatine fairly rapidly, gave the sugar reactions of B. typhosus, with the exception of the fermentation of saccharose, and agglutinated readily in the typhoid immune serum, but did not absorb typhoid agglutinins. It is to be regretted that the State Department of Health laboratory was not notified in season to make a careful study of this epidemic.

In connection with the diphtheria examinations, a very atypical culture was isolated. It was found that practically all of the forms in the cultures were diphtheria-like after a very short period of incubation. After longer incubation more of the forms present were coccoid and after still longer incubation very few diphtheria-like bacilli were present. The culture reacted on both the control and the test-pig when its virulence was being determined, and it proved pathogenic when inoculated subcutaneously. At first it was thought that the culture might be contaminated, but this proved not to be the case.

A pure culture of Gram negative cocci which proved to be Micrococcus catarrhalis was isolated from a specimen of spinal fluid containing large number of pus cells. From the physician sending this specimen we later learned that after the use of antimeningococcus serum the patient had recovered. Since the Micrococcus catarrhalis is an aerobic organism it might have been present, in this instance, as a contaminant and developed during transit.

In addition to the routine examinations of specimens there has been some time for investigations. Two papers were read at the March meeting of the New York State Association of Public Health Laboratories, one by Miss Stewart on "Confirmatory Tests on Throat Cultures Reported as Unsatisfactory Owing to the Presence of Organisms Morphologically Atypical," and the other by Dr. Youland on "Identification of B. diphtheriae and Diptheria-like Organisms."

For more than a year tests have been made to determine the efficiency of killed cultures of typhoid bacilli for use in the agglutination test for typhoid fever. It has been found that killed cultures, after being kept for a few months, are not satisfactory for miscroscopic agglutination tests, but are apparently satisfactory for macroscopic tests.

Considerable difficulty has been experienced with group agglutinins in serums used as controls in the agglutination tests. By absorbing the group agglutinins, in some cases satisfactory results could be obtained with serums that have fairly large amounts of group agglutinins before the absorption.

Cell counts have seldom been made on specimens of spinal fluid unless the specimens are fresh, since it has been thought that the cells disintegrate rather rapidly after the fluid is drawn. When Dr. Roby of Rochester visited the laboratory we discussed this problem with him. He considered the cells in these specimens to be quite resistant and suggested that, after making the cell counts, he send part of each specimen to Albany. The counts on the few specimens examined in the two laboratories were almost identical, indicating that in some cases at least the cells in spinal fluid do not disintegrate rapidly.

Miss Langworthy and Miss Willson have found, from a study of the comparative value of testing complement and amboceptor for routine complement fixation tests, that the titration of complement for adjusting the hemolytic system is more satisfactory than the use of a fixed quantity of complement and the adjustment of amboceptor. Since July, 1920, the titration of complement for adjusting the hemolytic system has been adopted.

The preservation of amboceptor with glycerine is being tested and seems highly satisfactory. Through the use of glycerine as a preservative, there will be little danger of amboceptor sent to approved laboratories becoming contaminated after the containers have been opened.

In studying different methods for the preparation of antigen, the one described by Neymann and Gager has proved of special interest.

Data relative to the tests made in 1919 in which there was a marked discrepancy between the results obtained with the plain alcoholic and the cholesterinized antigen have been tabulated in the hope of determining why specimens occasionally give different reactions when tested with these antigens.

It has seemed desirable to institute in the laboratory here the procedure, used in some of the laboratories in California, of diluting specimens of serum that proved anticomplementary in the routine complement fixation tests. In tests on specimens of spinal fluid, controls are being used in a wider range, smaller amounts being added to the series. Specimens of spinal fluid that prove strongly positive may thus be reported even if in the larger amounts tested they are anticomplementary.

The effect of natural amboceptor on the complement fixation test for syphilis is under investigation. Progress is also being made in testing the effect of different hydrogen ion concentrations on the reagents used in this test.

From an attempt to immunize a horse with sheep cells, it was found that the animal inoculated did not have an amboceptor titer sufficiently high for practical use. When the serum was fractionated the amboceptor was present

in the euglobulin and pseudoglobulin fractions, and a trace only was present in the albumin fraction. These findings correspond to the results Miss van Sann and the writer obtained in attempting to concentrate amboceptor made by immunizing rabbits. In the case of the amboceptor from the horse, the agglutinins for sheep red blood cells were found to be present in large amounts and after fractionation were present in the same fraction of the serum as the amboceptor. Fractionating by the methods employed for antitoxin does not, therefore, appear satisfactory for separating the amboceptor from the agglutinins.

Various methods have been tried for staining Treponema pallidum in dried smears. We found that the Fontana stain gave the best results if the smears were properly made. It is doubtful, however, if the staining of dried smears will ever be wholly satisfactory for the early diagnosis of syphilis.

In order to arrange for field work the members of the diagnostic department so far as possible have been given experience in all of the different types of laboratory work that we are doing so that changes in assignment might be readily effected.

Throughout the year we have been able to meet requests from local laboratories for workers to serve either during the illness of some member of their staff or at other times of emergency. The time that the different workers have been away for this purpose, when added together, amounts to seven months and a half.

Under the direction of the State Department of Health five group consultation clinics have been held, for which the necessary supplies and equipment have been furnished by the laboratory. Since the complement fixation test for syphilis was not made at the clinics, the specimens were mailed each day by special delivery to the central laboratory. Specimens of blood for chemical examination were sent to the Albany Hospital laboratory. All the other routine examinations were made at the clinics. The work of these clinics proved interesting and helpful to the members of the staff in charge, but it was frequently difficult to spare them from the central laboratory.

A number of workers from other laboratories have visited us to learn our methods; some of them have come from other countries. Most of them, however, were either sent from local laboratories or were preparing to take positions in local laboratories.

Of special interest is the marked increase in the number of laboratories applying for approval — sixty-seven were approved, an increase of thirty-four over the number approved in 1919.

In many cases where members of the staff were unable to visit laboratories seeking approval, unstained smears were sent to be examined for diphtheria bacilli, tubercle bacilli and gonococci. The laboratories were requested to examine these smears and return them together with the reports of their findings. In this way we were able to judge the character of the stains used as well as the correctness of the reports.

Specimens of dried blood were sent in November to all of the laboratories approved for the agglutination test for typhoid fever. The results reported were so discrepant that it seemed wise to send them specimens again and use a measured amount of serum instead of drops of dried blood. It is hoped that this method will prove more satisfactory.

Specimens for diagnosis were likewise sent to all laboratories desiring approval for the complement fixation test for syphilis. The results of these tests in the laboratories that were approved have been most satisfactory.

In December the suggestion was made to the directors of approved laboratories that they present a résumé of their year's work. A number complied with this request. In many instances they reported an increase both in the scope of the work and in the number of specimens examined. Of the new work that is being undertaken, blood chemistry, special spinal fluid examinations and virulence tests, in a few cases, are deserving of mention. Several laboratories reported additions to their equipment and some have obtained appropriations for additional workers.

In conclusion it may be said that the opportunities during the year for

special investigation have added interest and enjoyment to the performance of the daily routine, and results from this study and investigation have led in some instances to changes in technical methods which simplify and improve the work.

Also, it is especially gratifying to note the cordial spirit of coöperation shown by the workers of the approved laboratories. It is hoped that the relations which have been established are as suggestive and helpful to these laboratories as they have been to the central laboratory at Albany.

Water and Analytical Chemical Laboratories

L. M. WACHTER

Water Examinations

The number of water examinations made by the laboratory is an increase over that of last year. Since most of the water examinations are made of samples collected by members of the staff of the Engineering Division in connection with its inspections and investigations of public water supply problems, the increase in the number of samples reflects the increased activity of the Engineering Division in this particular field.

A recent review made by the Engineering Division of typhoid fever attributed to polluted water supplies very definitely indicates that there have been a number of outbreaks where there were installations for disinfection of the water supply by the use of liquid chlorine or of hypochlorite of lime, despite the effective work that has been accomplished by the investigation of public water supplies. These outbreaks evidently resulted from some of the following causes: The use of unsatisfactory equipment; the breaking down of the equipment at intervals; the use of the sterlizing apparatus only intermittently; and the careless or inefficient operation of the equipment. These facts emphasize the desirability of more frequent inspection and closer control of such supplies. It is possible for the laboratory to handle a larger volume of water work and it could, therefore, materially assist the Engineering Division in more frequent control of such water supplies.

For the information of health officers it seems desirable to repeat the substance of statements made in previous reports in reference to water examinations. The laboratory is prepared to make examinations of water samples from private supplies for any health officer when in his judgment such examinations are desirable, if he will make an inspection of the source of the water to be examined and will report the results of his inspection upon the proper cards furnished with the water containers by the laboratory. Statistical tables of the number of water examinations and tables of the results of examinations of water samples from public supplies or from sources involved in public supply investigations are to be found on pages 181–218.

Special Chemical Examinations

There has been no appreciable increase during the year in the number of special chemical problems studied by the analysts of the water laboratory for health officers, physicians and the Engineering Division. Among the studies was one on the different wastes from the Solvay Gas Works located on the Niagara River, below Buffalo. Tests were conducted to determine if the wastes produced a noticeable taste or odor when mixed alone with Niagara River water in different dilutions and also when mixed with Niagara River water and then treated with different amounts of chlorine.

Materials for the treatment of the water supplies at some of the state institutions were tested in connection with investigations of the Engineering Division.

In connection with special problems, tests were made of preparations for the presence of narcotics. Proprietary remedies were tested for the presence of methyl alcohol. Pills that were suspected of having been used for an illegal purpose were tested and found to contain only a diuretic.

Much of the time of the analysts has been devoted to making standard solutions for other groups in the laboratory and in coöperating in the manufacture of arsphenamine by analyzing the raw materials and intermediate products, in testing the finished product and in trying out and modifying methods for this analytical work.

Apparatus and Equipment

The development of the details of much of the larger apparatus and equipment in the new laboratory and its installation and adjustment by the contractors has required a large amount of study and supervision. Most of this detail work has been carried out by the head of the group.

It has been demonstrated that it is thoroughly practical to use for dry air sterilization at temperatures between 150° C. and 160° C. large chambers heated by high pressure steam (110 to 115 pounds) circulating in the hollow walls of the chambers. The method assures that a sufficiently high temperature is reached and eliminates all danger of burning the material to be sterilized. This danger is well recognized as an inherent defect in all gas heated dry air sterilizers. However, the installation of apparatus that would withstand the high steam pressure without developing minor leaks within the sterilizing chamber presented new problems to the contractor and required close coöperation on the part of the laboratory in order to be assured that the apparatus as finally installed would permanently fulfill the requirements of the service.

The installation of a battery of ten autoclaves arranged in a compact unit also presented a problem with many details to be worked out before the work was satisfactorily completed. These autoclaves are equipped with recording temperature gauges and with air pressure and vacuum systems, also with all necessary controls. This makes it possible to accurately vary the temperature of sterilization over a long range from low temperatures to 120° C. and to quickly cool the material after sterilization when it is desirable to do so.

The experimental fractionating still and extraction apparatus designed to make it possible to use it for many different purposes, the alcohol and ether-recovery still, and the distilled water apparatus with its storage and block-tin distribution systems, were installations that have also required close supervision.

Luncheon Room

Owing to the fact that there are practically no restaurants or lunch rooms easily accessible to the laboratory building it became apparent, soon after moving into new quarters, that some provision for furnishing noon luncheons at moderate cost would be necessary. There being no other place available, one of the laboratory work rooms was temporarily set aside for this purpose and ultimately, with the approval of the Civil Service Commission and Comptroller, a competent superintendent was appointed and essential equipment secured.

Under the direction of Miss Alice Humiston, regular luncheons have been furnished to members of the staff for thirty-five cents, and the large number of employees who bring their own lunches have been able to supplement them with coffee, cocoa, soup, or other articles from the daily menu at small cost. Aside from the salary of the superintendent and the cost of gas used in cooking, the luncheon room has at all times been self-supporting and the superintendent has been able to maintain a small balance to cover emergencies.

In many respects the present arrangement is unsatisfactory and hence is regarded as a temporary expedient. Owing to the demands upon the laboratory, the space set aside for the luncheon room is seriously needed for other purposes. In the one small room available, lunches are prepared and served and dishes washed: confusion is reduced to a minimum only through the skillful management of the superintendent. In order to serve all of the applicants, four "shifts" are necessary, service beginning at 11:30 a. m., the last luncheon being served at 1:15 p. m. On an average, ninety persons use the luncheon room daily.

Laundry

The two new positions for laundresses allowed by the Legislature made it possible to operate our own laundry. This has resulted not only in a financial saving, so far as laundry bills are concerned, but the laboratory gowns, for the better care they receive, are giving longer service.

Preparation of Media and Glassware

A. L. BAILEY

In looking over the year's work of the Media and Glassware Department, it may be seen that as a general service group its routine work has increased as the need throughout the laboratory for all kinds of media and glassware has increased. Also much has been accomplished during 1920 in the way of systematizing and adapting the work to new equipment and surroundings. The most important improvement has been made in the work of sterilization. The American sterilizers installed in December make it possible by means of a steam-heated jacket to obtain a dry heat of 150–160° C. in the inner chamber. By means of this new apparatus, together with a battery of ten Bramhall, Deane Co. autoclaves, added in May, all the sterilizing of the department is done during the daytime.

In April our electric meat-grinder was set up. Since then all meat has been bought in chunks and trimmed by workers in the group. By this procedure a fat free medium is insured and valuable data in regard to the condition of the meat before trimming is obtained for our media records. The information is especially useful in connection with the preparation of toxin and pneumococcus broths. A record system for the media work has been carefully worked out so that each step may be checked and a permanent record kept. Various other adjustments and changes have been made to facilitate the work.

Preparation of Glassware

In the glassware department new cupboards have been built. The stock supply is kept in one cupboard and the sterilized glassware for distribution in the other. Specially designed sinks and the Leonard valve apparatus, which mixes hot and cold water, have improved and made the work easier. The whole procedure of washing, sterilizing and distributing glassware has been systematized and correlated with that of the diagnostic boxing group, and the direction of the work assigned to responsible persons. As far as possible workers are to stand at the sinks only half a day, and prepare diagnostic outfits during the other half.

Special Work

In addition to titration with phenolphthalein, the hydrogen ion concentration reactions have been taken, both initial and final, on all media, since last March. In most cases the standard recipes have not yet been changed to include adjustment to the required pH.

Tests on washed glassware for use in serological work have covered a long period of time. This glassware had previously been treated with hydrochloric acid to neutralize any alkali set free from the glass. It was found that the final degree of alkalinity depended on the quality of the glass and the method of sterilization. Since acid-treated glassware was no less alkaline after sterilization than glassware which had not been "neutralized," this step was eliminated with a saving in both time and materials.

Executive and Secretarial Offices

I. M. DUTTON

The work of improving the office organization and of correlating the various activities embraced by this group has made encouraging progress during 1920. After widely canvassing the colleges and vocational bureaus two new workers

with excellent training were secured. By thus supplementing its staff with adequately trained secretaries the office has handled, with but few additions to its clerical staff, the greatly increased work represented in the keeping and filing of the records necessitated by the activities of the individual laboratories and in the purchase of equipment and supplies for the maintenance of their work.

All this progress has been made in spite of the difficulty of securing candidates for positions. The labor turnover for the entire laboratory staff during 1920 was 61 per cent. The office staff figured largely in this turnover and it has been found exceedingly difficult to fill vacancies when commercial enterprises offer higher salaries for work of a much less exacting nature

The law passed by the Legislature requiring the rating of all civil service employees holding competitive positions has met with much opposition and some sharp criticisms from the various State departments. The efficiency rating system in effect in the laboratory, developed according to specified regulations, after revisions and discussions open to the entire staff, is now accepted as a matter of course, and keen interest is shown when the averages are posted three times a year. The individual record cards are kept open for inspection and indicate clearly just where a worker's strength or weakness lies, and the various reasons for the resultant averages. These averages are used by the Civil Service Commission in making competitive promotions, and within the laboratory to decide upon the promotion or demotion of noncompetitive workers. An interesting comparison has been made between civil service examination results and rating averages, the competitors standing in practically the same relation to one another. The effects of this system are seen in prompt attendance by the staff as a whole, regular attendance, except when it is absolutely unavoidable, introspection with regard to duties performed — such results proving the efficacy of a much discussed innovation. The system also gives to the superiors in charge an opportunity for a periodic review and comparison of workers to one another and to a standard.

The problem of the storage of material has been somewhat simplified since the laboratory stock room was completed. This was planned and equipped so that it embodies all the best features of approved laboratory stock rooms. Under the new storage system it is possible to keep the stock in good condition and its distribution to the staff is greatly facilitated.

The office of the Branch Laboratory is governed by the same standard methods under which the central laboratory operates and it is hoped that the improvement in its organization may be more fully developed during the coming year.

The laboratory has been planned and equipped as a model state public health laboratory, and interest in its building and organization is not confined to New York State. Representatives from institutions in other states and in foreign countries visit the laboratory to inspect the equipment and to see the sort of work which is done. The construction and equipment of the laboratory is of great interest to municipalities and institutions planning similar enterprises, and through the coöperation of Mr. Lewis Pilcher, State Architect, blue prints of the plans of the building have been sent to persons here and abroad who have asked for information in regard to the laboratory.

Library

MARY WILLIAMS

The library has shared in the generally increased activity which has characterized the work throughout the laboratory during 1920. Better service than hitherto is being given, for the library material has been conveniently arranged in the new library rooms, and all the literature is immediately available. The library now gives a certain desirable tone to the whole institution, and stimulates the members of the scientific staff to study the problems connected with their work. The director has deemed it wiser to extend the library influence by providing further necessary trained service, rather than to form a separate group to take charge of the scientific papers produced by the members of the staff.

As now organized, the library work divides itself into two distinct parts: The librarian collects, records, arranges scientific literature and every other sort of material useful to the staff — such as photographs, lantern slides, museum specimens, and so forth. She helps the members of the staff to look up and to obtain references, and brings literature appearing in the current journals to their notice. On the other hand, a scientific secretary keeps in touch with the work which the members of the staff are doing in the way of research and investigation, supervises the form in which outlines, reports, and finished papers are handed in, has the reports typed, filed and indexed for reference, and is responsible for the form of papers sent for publication. All papers prepared by members of the staff are kept in a special scientific file.

The strictly library work is well developed, and will be more and more satisfactorily performed as the librarian in charge becomes better acquainted with the scientific papers which are on file, and with the special subjects of interest to the staff. The library does not and never will contain many books, but it aims to have as complete a collection of literature as possible, bearing on a very limited field. According to the judgment of librarians experienced in such matters, a small amount of money spent intelligently and regularly during a number of years will result in a noteworthy reference library. There is lack in our country of reasonably complete reference libraries on special subjects.

The second division of the library work, the extension of the service to include gathering, classifying and preserving the results of the study and research work of the scientific staff, and supervising the preparation of outlines, reports and of scientific papers for publication — all this work is in the experimental stage — but even now a distinct improvement may be seen in the form and in the clearness and conciseness of the various papers prepared by members of the staff.

In a scientific institution supported by the people and pledged to perform certain definite services, not only the results of routine work are to be tabulated so that they may be compared and discussed, but also, so far as possible, the less tangible results should be put into a form that will be suggestive and helpful to the cause of public health and that will fully justify the necessary expenditure of time and thought and money. In short, the library is taking its place as an integral part of the laboratory organization. On the one hand it serves the laboratory staff in its ordinary library capacity, and on the other it coöperates with the secretarial unit to gather up and to evaluate the results of scientific investigation and research carried on in the laboratory.

Field Activities and Correlation with Other Divisions and Agencies

PAUL B. BROOKS, M. D., *Assistant Director*

Undoubtedly the most important functions of the assistant director are those which relate to the various field activities of the laboratory, over which he has had general supervision, and to the correlation of the activities of the laboratory with those of other agencies, including other divisions of the department and local health organizations.

Special effort has been made, with the coöperation and assistance of the district sanitary supervisors, to stimulate interest in the development of new local laboratories where needed, to extend the field and scope of those already established and efficient, and to encourage improvement in standards maintained.

There are at present sixty-seven approved laboratories in the State, including six in New York City, besides several others, the approval of which is pending or under consideration. There is evidently a gradual development in standards and an increase in uniformity of results obtained in diagnostic examinations. During the year this division has been coöperating with the State Hospital Commission in an effort to make the facilities of laboratories maintained by State hospitals for the insane available for local public health laboratory work in selected instances. On several occasions workers have

been assigned to assist in local laboratories in emergencies, and upon request, local laboratories have been furnished with culture media and certain other products for emergency use. Field laboratory service has been organized in connection with five group consultation clinics held under the auspices of the State Department of Health.

During the year a much needed improvement has been initiated in the system of distribution of laboratory supplies, which in the past has not been relatively economical and in certain respects has been unsatisfactory. The last Legislature enacted a law authorizing the State Commissioner of Health to establish district laboratory supply stations, to fix the limits of districts to be served by them and to appoint a custodian for each. Inasmuch as the success of the new system of distribution depends in large measure upon the care with which districts are arranged and custodians selected, ample time has been given to consideration of local conditions and to consultation with sanitary supervisors. The State has been tentatively divided into approximately one hundred and fifty districts and it is planned to proceed with organization immediately. It is believed that the new arrangement will make it possible for physicians using laboratory supplies to obtain them much more easily and promptly and for much better control to be maintained over conditions under which such supplies are cared for and distributed.

It has always been recognized that a cordial spirit of cooperation among all workers concerned is necessary if the laboratory is to be of the most service to the various communities, and this year it has been possible as never before to bring the laboratory into contact with field workers and to give sufficient attention to their individual problems.

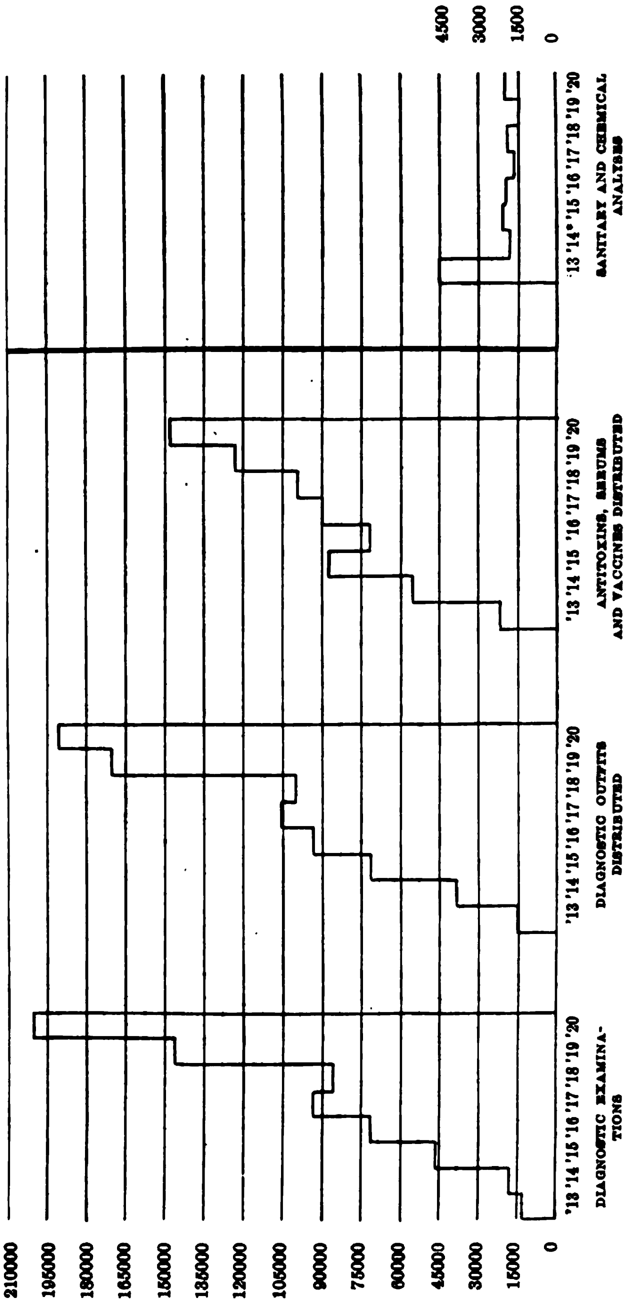
Talks and addresses have been given on various occasions by members of the staff, including the assistant director, with a view to disseminating popular information regarding the value of public health laboratory service to the State and the community. Plans are under way for a series of stereopticon slides to be used in connection with popular lectures on this subject.

During the year a special effort has been made to keep fully informed regarding the activities of other divisions of the State Department of Health in so far as these activities bear any relation to those of the Division of Laboratories and Research and to keep the directors of other divisions more closely in touch with the work of the laboratory than has been possible in the past. The most important development in this connection has been that of a weekly "interdivisional" conference, at which related activities of the various divisions for the week have been discussed. The writer, having had occasion to take the first official steps in connection with the project, has been called upon to preside at the conferences.

Since it has been possible to maintain closer relations with field workers, the department's corps of district sanitary supervisors has rendered services of the greatest value in connection with the organization and supervision of supply stations, the promotion and extension of local laboratory service and other work in the field.

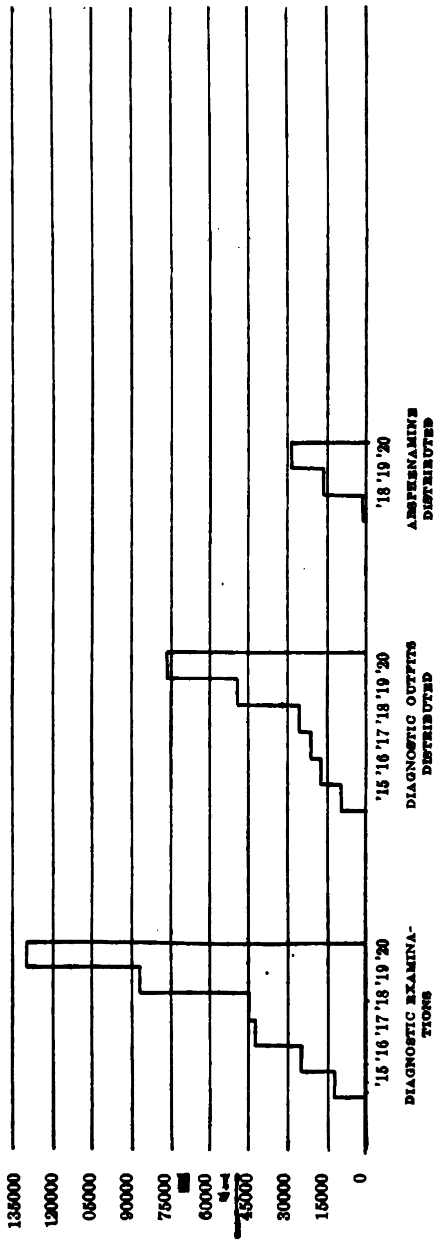
The various administrative activities of the assistant director for the year — during a part of which he was also serving as acting secretary of the State Department of Health — which do not fall within the scope of this summary, are referred to elsewhere or covered by various reports in the official files.

CHART SHOWING INCREASE OF WORK



* Inspection of the sources of all samples examined in the laboratory were required for the first time in 1914.

CHART SHOWING THE INCREASE OF THE WORK FOR THE DIAGNOSIS AND TREATMENT OF SYPHILIS AND GONORRHEA



DISTRIBUTION OF SERUMS, VACCINES AND OTHER PROPHYLACTIC AND THERAPEUTIC PREPARATIONS AND MISCELLANEOUS SUPPLIES

	Serums					Vaccines								
	Antipneumococcus (50 cc. bottles)	Antimeningococcus (20 cc. bottles)	Antidysentery (20 cc. bottles)	Antianthrax (50 cc. bottles)	Poliomyelitus *	Typhoid	Paratyphoid	Typhoid-paratyphoid	Dysentery	Pertussis	Smallpox — (10 doses per bottle)	Rabies	Pneumococcus	Influenza
1914, number of packages	....	....	..	..	..	1,457	...	.....	..	....	.....	.....	...	.....
1915, number of packages	16	30	...	..	..	5,656	...	.....	..	211	.....	.....	...	.....
1916, number of packages	433	426	22	..	65	6,058	106	.....	23	4,127	515	10	...	.....
1917, number of packages	2,253	1,963	614	..	..	7,690	739	920	64	4,521	3,951	215	...	.....
1918, number of packages	8,330	1,544	814	..	..	3,663	273	2,397	10	5,970	355	1,623	203	8,245
1919, number of packages	806	886	77	..	..	2,307	20	2,421	8	3,035	7	896	3	204
1920, number of packages	405	950	85	3	..	2,690	27	5,015	..	6,888	10	149	...	.....

	Arsphenamine														
	1.2 gram	1.0 gram	0.6 gram	0.4 gram	Tuberculin	Ophthalmia neonatorum outfits	Outfits for the Schick test	Diphtheria toxin-antitoxin mixture	Dysentery toxin-antitoxin mixture	Standard and diagnostic serums, toxin, etc.	Normal horse serum	Media (bottles)	Media (tubes)	Keidel blood culture tubes	Cultures
1914, number of packages	...	.....	......	......	....	24,650	...	......	....	.....	..	......	......	..	...
1915, number of packages	...	.....	......	......	....	43,307	...	......	....	1	..	......	......	..	...
1916, number of packages	...	.....	......	......	6	30,798	4	......	....	4	..	......	......	..	...
1917, number of packages	...	.....	......	......	36	27,077	138	188	[1] 188	[2] 780	..	[3] 438	1,016	..	350
1918, number of packages	...	.....	510	489	36	27,508	67	442	....	[4] 638	..	[5] 21	1,281	..	326
1919, number of packages	...	3,315	7,145	5,772	24	30,074	115	631	....	[6] 781	37	[7] 1,439	127	..	520
1920, number of packages	301	6,093	14,103	8,461	176	32,337	230	1,902	....	[8] 1,702	30	[9] 282	1,309	31	566

[1] (455 cc.) [2] (19,736 cc.) [3] (110,667 cc.) [4] (244,292 cc.) [5] (450 cc.) [6] (51,430 cc.) [7] (17,560 cc.) [8] (48,236.5 cc.) [9] (98,430 cc.)

* Poliomyelitis serum used in the treatment of poliomyelitis and the vaccine used against smallpox have been distributed only to meet special emergencies. Smallpox vaccine is not yet ready for general distribution. Supplies of the pure vaccine are sent to institutions or schools where it will be used immediately in order to secure practical tests of the variations in its potency, which cannot as yet apparently be controlled in the manufacture on a large scale. This vaccine is the pure vaccine prepared by the methods of Dr. Noguchi of the Rockefeller Institute.

DISTRIBUTION OF DIPHTHERIA AND TETANUS ANTITOXINS AND RECORD OF ADMINISTRATION

YEAR	Record of Distribution — Packages distributed — Total number of packages	Record of Distribution — Packages distributed — 1,000 units* packages	Record of Distribution — Packages distributed — 3,000 units packages	Record of Distribution — Packages distributed — 6,000 units packages	Record of Distribution — Total number of units antitoxin distributed†	Record of Distribution — Average number of units per cc.	Record of Administration Based on Reports from Health Officers and Physicians — Immunizations reported — Total number	Immunizations reported — Total number of units used	Cases treated and reported — Total number	Cases treated and reported — Total number of units used	Recoveries in cases treated — Total number	Recoveries in cases treated — Total number of units used	Deaths in cases treated — Total number	Deaths in cases treated — Total number of units used	Cases in which diagnosis was indeterminate yet treated with antitoxin — Total number	Cases in which diagnosis was indeterminate yet treated with antitoxin — Total number of units used
Diphtheria Antitoxin																
1902	...	...	...	...	9,828,000	300	...	...	...	...	...	...	...	...	...	...
1903	...	...	...	...	21,181,500	325	...	...	...	...	...	...	...	...	...	...
1904	...	...	...	...	24,561,000	375	...	...	...	...	...	...	...	...	...	...
1905	...	...	...	...	24,462,000	350	...	...	...	...	...	...	...	...	...	...
1906	...	...	...	...	26,681,000	350	...	...	...	...	...	...	...	...	...	...
1907	...	...	...	...	35,443,500	450	...	...	...	...	...	...	...	...	...	...
1908	...	...	...	...	38,203,500	350	...	...	...	...	...	...	...	...	...	...
1909	...	...	...	...	36,643,500	370	492	2,000,000	1,369	11,250,000	1,235	10,000,000	134	1,250,000	42	618,750
1910	...	...	...	...	55,374,000	530	3,920	5,000,000	1,863	13,500,000	1,700	11,700,000	163	1,800,000	35	700,000
1911	...	...	...	...	65,563,500	550	3,921	9,530,350	2,566	18,317,650	2,354	15,813,650	212	2,504,000	52	174,500
1912	...	...	...	...	61,117,500	550	5,024	7,574,095	2,535	20,996,200	2,345	18,779,700	190	2,216,500	150	450,000
1913	...	...	...	...	66,639,000	600	3,055	6,134,400	1,943	13,612,000	1,766	11,892,600	177	1,719,400	...	474,000
1914	26,461	...	...	...	78,966,000	‡552	1,994	3,721,950	2,149	14,706,050	1,982	12,693,950	167	2,012,100	285	1,473,500
1915	29,470	...	...	...	83,473,500	791	1,966	4,258,350	2,687	15,225,250	2,370	12,201,750	317	3,023,500	74	251,400
1916	21,171	...	...	...	89,704,500	1,040	1,920	4,556,500	2,129	17,150,200	1,964	15,095,800	165	2,054,400	25	87,500
1917	28,587	...	...	...	101,535,000	896	1,393	1,650,700	1,483	12,096,200	1,372	10,809,100	111	1,287,100	24	82,500
1918	27,031	...	...	...	87,306,000	850	767	876,662	1,188	9,843,300	1,058	8,702,400	130	1,140,900	91	352,000
1919	52,376	14,582	20,945	16,849	178,511,000	874.65	1,170	1,518,500	1,288	11,312,500	1,207	10,195,000	81	1,117,500	209	1,284,300
1920	52,891	13,157	20,709	19,025	189,434,000	847.15	1,140	1,426,900	1,216	13,363,100	1,138	11,764,100	78	1,509,000	368	2,228,300
Tetanus Antitoxin		1,500 units	10,000 units	20,000 units												
1909	...	...	...	...	6,369,500	...	...	819,950	15	...	5	...	10	687,000	...	...
1910	...	...	...	...	14,482,500	...	...	326,400	14	...	5	...	9	1,950,500	...	...
1911	...	...	...	...	12,142,500	...	...	587,400	23	...	7	...	16	1,474,000	...	...
1912	...	...	...	...	12,762,000	...	...	791,450	31	...	9	...	22	1,418,000	...	...
1913	...	...	...	...	11,719,500	...	...	740,400	25	...	8	...	17	1,328,000	...	...

* Before May, 1917, packages containing 1,500 units diphtheria antitoxin were distributed for immunization. † From 1914 for actual number of units distributed, add 20 per cent representing excess contained in each package over number of units given on label. ‡ From this date all antitoxin accurately standardised.

DISTRIBUTION OF DIPHTHERIA AND TETANUS ANTITOXINS AND RECORD OF ADMINISTRATION — (*Continued*)

YEAR	Record of Distribution						Record of Administration Based on Reports from Health Officers and Physicians									
	Packages distributed						Immunizations reported		Cases treated and reported		Recoveries in cases treated		Deaths in cases treated		Cases in which diagnosis was indeterminate yet treated with antitoxin	
	Total number of packages	1,500 units packages	10,000 units packages	20,000 units packages	Total number of units antitoxin distributed†	Average number of units per cc.	Total number	Total number of units used	Total number	Total number of units used	Total number	Total number of units used	Total number	Total number of units used	Total number	Total number of units used
1914	7,005	....	....	....	24,075,000	....	699	1,762,200	15	....	2	....	13	153,500	......	....
1915‡	8,664	....	....	....	42,142,500	‡1,024	410	823,800	16	390,000	2	16,000	14	374,000	......	....
1916	8,842	....	....	....	34,959,000	971	778	1,275,450	66	1,656,100	33	727,100	33	929,000	......	....
1917	8,616	....	....	....	39,441,000	1,056.9	558	1,202,250	28	439,800	24	293,500	4	146,300	......	....
1918	8,063	....	....	....	41,221,500	845	379	786,890	11	638,500	8	554,500	3	84,000	......	....
1919	10,869	8,008	1,939	842	48,362,000	850.28	503	1,067,900	14	1,378,500	4	993,000	10	385,500	......	....
1920	11,797	9,512	1,491	794	45,058,000	742	552	883,300	15	1,070,000	12	802,500	3	267,500	......	....

For footnotes, see preceding page.

DISTRIBUTION OF DIAGNOSTIC OUTFITS

	Diphtheria culture outfits and tubes	Tuberculosis sputum outfits	Typhoid fever Widal outfits	Typhoid fever feces outfits	Syphilis-blood serum outfits	Gonorrhea smear outfits	Malaria smear outfits	Miscellaneous outfits	Total
1913	*	*	*	*	*	*	*	*	15,984
1914	*	*	*	*	*	*	*	*	39,396
1915	41,419	8,391	6,666	3,181	9,103	1,138	356	2,108	72,362
1916	49,331	9,096	†8,184	4,819	15,039	2,884	1,267	3,555	94,175
1917	59,204	9,866	6,269	3,448	20,566	2,095	971	4,217	106,636
1918	53,791	9,300	4,290	1,931	23,146	3,038	824	3,839	100,159
1919	91,150	13,230	4,969	3,435	43,929	5,822	348	6,226	169,109
1920	82,516	15,940	5,354	4,007	71,195	5,835	....	6,118	190,965

* No record. † This exceptional increase is due to the paratyphoid epidemic among the troops returning to the State from the Mexican border.

DIAGNOSTIC EXAMINATIONS

Central Laboratory, Albany, N. Y.

	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Diphtheria:													
Throat cultures:													
Positive	741	755	1,822	1,761	1,322	2,909	4,242	7,135	7,082	7,625	6,483	12,627	7,369
Negative	735	1,014	4,580	5,573	4,298	6,127	8,704	11,330	11,795	17,613	11,038	18,085	12,872
Unsatisfactory	121	201					917	804	1,577	1,569	1,652	2,986	2,099
Supplementary tests								4,824	4,813	4,892	2,600	2,256	3,911
Virulence tests								37	221	69	96	353	
Positive													288
Negative													135
Unsatisfactory													123
Supplementary tests													571
Epidemic — Poughkeepsie									107				
Public health clinics													14
Total	**1,597**	**1,970**	**6,402**	**7,334**	**5,620**	**9,036**	**13,863**	**24,130**	**25,595**	**31,768**	**21,869**	**36,307**	**27,322**
Enteric diseases:													
Blood (agglutination test):†													
Typhoid and paratyphoid:													
Positive:													
Typhoid	147	92	254	288	297	350	435	610	965	937	865	631	573
Paratyphoid A*										1	2	4	
Paratyphoid B*										2	8	3	6
Combined										43	5	5	3
Negative	282	179	378	441	552	665	896	970	1,966	1,874	1,668	1,455	1,324
Unsatisfactory	70	87						208	106	237	415	307	427
Supplementary tests													4,906
Public health clinics													3
Total	**499**	**358**	**632**	**729**	**849**	**1,015**	**1,331**	**1,788**	**3,037**	**3,094**	**2,963**	**2,405**	**7,242**
Dysentery:*													
Positive										1		6	4
Negative										1		13	3
Supplementary tests													9
Epidemic (Poughkeepsie and 2d Regiment)									3,174				
Total									**3,174**	**2**		**19**	**16**
Total	**499**	**358**	**632**	**729**	**849**	**1,015**	**1,331**	**1,788**	**6,211**	**3,096**	**2,963**	**2,424**	**7,258**
Intestinal discharge and urine:													
Positive:													
Typhoid								15	81	124	92	91	91
Paratyphoid A*											5	6	2
Paratyphoid B*										6	7		17
Dysentery*										6	14	14	23

DIAGNOSTIC EXAMINATIONS — (*Continued*)
Central Laboratory — (Continued)

	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Intes. discharge and urine — *Concluded*													
Negative								149	687	789	1,041	1,153	1,539
Unsatisfactory								20	4	2	27	77	64
Supplementary tests													381
Epidemic (Poughkeepsie and 2d Regt.)									1,567				
Total								**184**	**2,339**	**927**	**1,186**	**1 341**	**2 117**
Syphilis:													
Complement fixation test:													
Positive								1,212	2,474	3,378	3,704	5,392	6,695
Negative								3,378	5,854	9,002	9,619	14,748	28,390
Unsatisfactory								219	454	706	921	976	1,983
Doubtful								847	1,249	1,821	1,988	9,809	7,670
Supplementary tests								6,524	11,304	17,292	14,517	37,434	54,131
Dark field examinations													3
Supplementary tests													4
Total								**12,180**	**21,335**	**32,199**	**30,749**	**68,359**	**98,876**
Gonorrhea:													
Complement fixation test:													
Positive								1	55	150	199		
Negative								22	836	1,909	1,105		
Unsatisfactory								24	64	244	122		
Doubtful								7	293	626	248		
Supplementary tests								5	2,056	2,414	999		
Total								**59**	**3,304**	**5,343**	**2,673**		
Microscopical examinations:													
Positive								17	128	100	180	666	623
Negative								76	868	241	553	1,200	1,224
Unsatisfactory								5	148	53	46	247	191
Supplementary tests													1,551
Public health clinics													8
Total								**98**	**1,144**	**394**	**779**	**2,113**	**3,597**
Tuberculosis:													
Sputum examinations:													
Positive	329	526	584	658	793	691	875	1,117	1,370	1,423	1,402	1,622	1,710
Negative	498	1,245	1,277	1,755	1,966	2,192	2,318	2,198	3,919	4,464	4,460	5,549	5,492
Unsatisfactory	15	5						62	36	28	34	15	291
Supplementary tests													8,157
Public health clinics													94
Total	**842**	**1,776**	**1,861**	**2,413**	**2,759**	**2,883**	**3,193**	**3,377**	**5,325**	**5,915**	**5,896**	**7,186**	**15,744**

Pneumonia:													
Pneumococcus type differentiation													
Sputum:													
Positive:													
Type I										127	126	36	23
Type II										38	25	17	4
Type II atypical										26	6		
Type III										70	51	43	57
Type IV										146	96	103	69
Combined											19	4	2
Negative										137	326	290	106
Unsatisfactory										27	29	8	37
Supplementary tests										6	2	232	33
Total								17	174	577	680	733	331
Urine:													
Negative										4			
Spinal fluid:													
Positive Type IV										1			
Negative										1			
Total										2			
Total								17	174	583	680	733	331
Influenza:													
Positive											11	39	
Negative											121	38	
Unsatisfactory													
Doubtful											9		
Total											141	77	
Malaria:‡													
Positive													4
Negative													80
Unsatisfactory													18
Supplementary tests													73
Total													175
Miscellaneous examinations:													
Discharges, pus, etc.													303
Supplementary tests													726
Public health clinics													21
Intestinal discharge													76
Supplementary tests													150
Public health clinics													15
Urine analyses													153
Supplementary tests													362
Public health clinics													312
Sputum													93
Supplementary tests													257
Public health clinics													7
Blood													114
Public health clinics													306

DIAGNOSTIC EXAMINATIONS — (*Continued*)
Central Laboratory — (Concluded)

	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Miscellaneous examinations—*Cond'd.*													
Blood cultures													34
Supplementary tests													87
Epidemic (Poughkeepsie and 2d Regt.)									60				
Blood — chemical analyses													1
Supplementary tests													2
Public health clinics													1
Stomach contents													2
Supplementary tests													6
Public health clinics													1
Spinal fluid													407
Supplementary tests													519
Public health clinics													7
Pleural, ascitic and other fluids													41
Supplementary tests													186
Public health clinics													2
Pathological specimens													140
Supplementary tests													75
Animal tests (autopsies)													172
Supplementary tests													209
Unclassified													19
Supplementary tests													29
Total							91	151	688	740	631	1,280	4,835
Special investigations:													
Chemical analyses											148	102	312
Bacteriological examinations													26
Pathological examinations													2
Microscopical examinations													10
Laboratory investigations													122
Supplementary tests													126
Grand total	2,938	4,104	8,895	10,476	9,228	12,984	18,478	41,984	66,115	80,965	67,715	119,922	160,853

* Figures for 1917 represent examinations from July 1.
† Since August, 1919, all specimens of blood have been tested with cultures of B. paratyphosus A and B besides B typhosus.
‡ Previous to 1920 listed under miscellaneous examinations.

DIAGNOSTIC EXAMINATIONS — (*Continued*)

Branch Laboratory, New York City

	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Diphtheria:													
Throat cultures:													
Positive								1,387	902	824	680	1,409	2,586
Negative								1,780	1,898	2,780	4,167	4,201	3,374
Unsatisfactory								458	325	241	469	901	1,796
Supplementary tests								100	564	1,047	893	1,338	2,061
Virulence tests									48	77	21	349	
Positive													196
Negative													558
Unsatisfactory													65
Supplementary tests											4	67	105
Total								**3,725**	**3,737**	**4,969**	**6,234**	**8,265**	**10,741**
Enteric diseases:													
Blood (agglutination test):													
Typhoid and paratyphoid:													
Positive:													
Typhoid								18	48	70	29	36	42
Paratyphoid A*												2	1
Paratyphoid B*												2	
Combined												3	
Negative								53	387	148	93	203	179
Unsatisfactory								13	8	30	43	131	98
Supplementary tests													5
Total								**84**	**443**	**248**	**165**	**377**	**325**
Intestinal discharge and urine:													
Positive:													
Typhoid								1	11	10	6	35	57
Paratyphoid A*													
Paratyphoid B*													
Dysentery*													2
Negative								2	532	1,689	90	141	633
Unsatisfactory									1	64	25	20	31
Total								**3**	**544**	**1,763**	**121**	**196**	**723**

DIAGNOSTIC EXAMINATIONS — (*Concluded*)

Branch Laboratory, New York City † — (Concluded)

	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Syphilis:													
Complement fixation test:													
Positive	...	...	...	...	...	...	...	62	224	1,320	747	776	854
Negative	...	...	...	...	...	...	...	201	935	2,960	1,186	2,257	2,569
Unsatisfactory	...	...	...	...	...	...	...	44	137	437	344	99	224
Doubtful	...	...	...	...	...	...	...	...	...	...	...	594	5,245
Supplementary tests	...	...	...	...	...	...	...	...	57	356	7,413	11,937	18,089
Total	...	...	...	...	...	...	...	**307**	**1,353**	**5,073**	**9,690**	**15,663**	**26,981**
Gonorrhea:													
Complement fixation test:													
Positive	...	...	...	...	...	...	...	19	7	23	36	37	6
Negative	...	...	...	...	...	...	...	13	96	567	271	310	21
Unsatisfactory	...	...	...	...	...	...	...	23	35	61	213	22	2
Doubtful	...	...	...	...	...	...	...	...	...	...	...	273	31
Supplementary tests	...	...	...	...	...	...	...	52	20	47	582	821	56
Total	...	...	...	...	...	...	...	**107**	**158**	**698**	**1,102**	**1,463**	**116**
Microscopical examinations:													
Positive	...	...	...	...	...	...	...	3	5	13	30	34	64
Negative	...	...	...	...	...	...	...	2	6	24	76	66	204
Unsatisfactory	...	...	...	...	...	...	...	1	3	5	29	14	16
Total	...	...	...	...	...	...	...	**6**	**14**	**42**	**135**	**114**	**284**
Tuberculosis:													
Sputum examinations:													
Positive	...	...	...	...	...	...	...	52	46	125	110	100	177
Negative	...	...	...	...	...	...	...	113	130	311	384	373	685
Unsatisfactory	...	...	...	...	...	...	...	...	5	6	44	9	27
Total	...	...	...	...	...	...	...	**165**	**181**	**442**	**538**	**482**	**889**
Pneumonia:													
Pneumococcus type differentiation:													
Sputum:													
Positive:													
Type I	...	...	...	...	...	...	...	...	...	...	13	6	3
Type II	...	...	...	...	...	...	...	...	...	...	8	4	...
Type III	...	...	...	...	...	...	...	...	...	...	4	13	12
Type IV	...	...	...	...	...	...	...	...	...	...	21	22	22
Combined	...	...	...	...	...	...	...	...	...	...	...	2	...
Negative	...	...	...	...	...	...	...	...	...	...	32	68	56
Unsatisfactory	...	...	...	...	...	...	...	...	...	...	9	12	4
Supplementary tests	...	...	...	...	...	...	...	...	...	...	80	168	40
Total	...	...	...	...	...	...	...	...	**33**	**123**	**167**	**296**	**137**

Influenza:													
Positive											13		
Negative											205		
Unsatisfactory											8		
Total											226		
Malaria:‡													
Positive													7
Negative													35
Unsatisfactory													9
Supplementary tests													2
Total													53
Miscellaneous examinations:													
Discharges, pus, etc.													30
Intestinal discharges													5
Urine analyses													14
Blood													36
Supplementary tests													1
Blood cultures													11
Spinal fluid													30
Supplementary tests													6
Pleural, ascitic and other fluids													2
Pathological specimens													47
Animal tests (autopsies)													5
Unclassified													32
Total								60	61	77	90	216	219
Special investigations:													
Bacteriological examinations													15
Milk examinations:													
Bacteriological													16
Supplementary tests													31
Water examinations:													
Bacteriological													148
Grand total								4,457	6,524	13,435	18,468	27,071	40,678

* Previous to January, 1918, examinations for paratyphoid fever and dysentery were recorded as typhoid examinations.

† Although located in New York City this laboratory does not serve the city but the outlying districts — Long Island, Rockland, Orange and Westchester counties.

‡ Previous to 1920 listed under Miscellaneous Examinations.

RECORD OF MEDIA PREPARATION

MEDIUM (routine)	1918	1919	1920
Agar beef extract	1,205,000 cc.	573,500 cc.	888,060 cc.
Agar beef infusion	759,500	737,000	560,950
Agar veal infusion	168,700	219,500	134,564
Beef infusion	587,500	774,000	1,341,670
Broth beef extract	449,400	278,500	322,650
Broth beef infusion	692,000	744,250	867,915
Broth veal infusion*	372,700	965,000	1,605,129
Bordet-Gengou medium	....	....	100
Carbohydrate serum waters	9,150	13,100	20,130
Dunham's solution	....	....	15,000
Gelatin	100,500	131,000	131,307
Nitrate solution	....	....	16,000
Veal infusion	169,000	211,000	181,622
Total	4,513,450	4,646,850	6,085,097
SOLUTIONS			
Aqueous carbohydrate solutions	145,400 cc.	29,500 cc.	58,170 cc.
Phenol	....	....	189,700
Sodium chloride (0.85 per cent)	....	....	707,700
Sodium chloride (0.5 per cent)	....	....	88,400
Sodium citrate	....	....	298,200
Sodium chloride, glycerin (typhoid)	....	....	59,141
Total	 145,400	 29,500	1,401,311
MISCELLANEOUS			
Milk	....	....	11,450 cc.
Andrade indicator	....	....	2,800
Phenolphthalein indicator	....	....	1,108
Total	....	....	15,358
MEDIUM (combined)			
Ascitic fluid semi-solid	....	....	3,744 tubes
Blood plates	....	....	3,858
Blood slants	....	....	2,005
Blood slants (influenza)	....	....	7,842
Blood slants (pertussis)	....	....	1,027
Dextrose serum agar	....	....	8,086
Loeffler's blood serum medium	53,950	50,200	91,922
Petroff's egg medium	....	....	832
Serum semi-solid	....	....	2,705
Total	53,950	50,200	122,021

* Includes toxin broths.

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SUMMARY OF DIAGNOSTIC EXAMINATIONS MADE BY THE APPROVED LABORATORIES OF NEW YORK STATE SINCE 1915

	1915	1916	1917	1918	1919	1920
Division of Laboratories and Research						
New York State Department of Health						
Central Laboratory in Albany	48,430	74,621	82,693	69,396	121,288	162,416
Branch Laboratory, New York City	4,457	6,524	13,435	18,468	27,071	40,678
State Institute for Study of Malignant Disease, Buffalo	......	2,120	2,330	2,282	3,387	3,909
COUNTY LABORATORIES						
Amsterdam — Julius Wasserman Laboratory (Montgomery County)	......	......	1,482	1,472	3,278	1,878
Auburn - Cayuga County Laboratory; also municipal and private work	......	......	......	......	....	3,536
Batavia — Genesee County Laboratory; also municipal hospital and private work	2,420	2,182	2,648	2,943	3,554	3,360
Belmont — Allegany County Hygienic Laboratory	107	488	583	643	618	1,383
Canandaigua — Ontario County Laboratory	1,507	1,379	1,408	934	1,544	823
Corning — Steuben County Hygienic Laboratory	4,268	5,617	7,536	7,055	9,147	8,521
Geneseo — Livingston County Laboratory	739	534	441	345	291	804
Glens Falls — Warren County Laboratory; also hospital work	3,520	6,263	5,205	1,875	4,326	4,910
Oneida — Madison County Bacteriological Laboratory	436	523	331	......	....	349
MUNICIPAL LABORATORIES						
Buffalo — Bureau of Laboratories; also county work	33,336	35,606	47,923	49,115	98,222	100,714
Elmira — Elmira City Laboratory; also county, hospital and private work	3,931	4,520	4,683	3,658	2,639	3,007
Geneva — Geneva City Laboratory	......	......	......	......	....	8,989
Gloversville — Gloversville City Laboratory; also county, hospital and private work	277	421	967	1,606	415	427
Jamestown — Jamestown City Laboratory	2,840	3,212	3,204	987	1,580	1,439
Kingston — City of Kingston Laboratory; also county and private work	......	......	......	......	1,651	3,834
Middletown — Laboratory City Department of Health	......	......	......	36	303	458
Niagara Falls — Laboratory City Department of Health	794	3,297	7,367	......	....	9,628
Olean — Olean City Laboratory	......	......	1,080	......	676	1,906
Poughkeepsie — Laboratory of the City Department of Health	......	853	1,925	2,115	6,450	2,663
Rochester — City Health Department Laboratory	2,545	3,596	7,053	7,727	11,296	19,099
Rome — Rome City Laboratory	258	631	522	569	220	995
Schenectady — Pathological Laboratory of the City and County of Schenectady; also hospital and private work	1,345	3,077	7,124	8,249	1,306	17,651
Syracuse — City Department of Health Laboratory; also county work	11,623	15,853	16,918	13,215	14,907	17,820
Troy — City Laboratory; also private work	1,372	1,388	1,766	2,487	4,000	3,851
Utica — Utica City Laboratory; also private work	643	765	......	2,506	5,594	5,446
Yonkers — Laboratory of the Department of Health	3,768	3,709	4,572	8,392	6,612	6,689
HOSPITAL LABORATORIES						
Albany — Albany Hospital Laboratory; also private work	......	......	......	11,462	10,360	13,524
Buffalo — Laboratory of Clinical Pathology, Buffalo General Hospital	......	......	......	......	....	5,259
Newburgh — St. Luke's Hospital, Pathological Laboratory	......	......	......	......	....	2,058
Poughkeepsie — Vassar Brothers Hospital Laboratory; also private work	......	......	......	......	....	5,186
Rochester — Hahnemann Hospital Diagnostic and Research Laboratory	......	......	......	......	....	5,962
Rochester — Pathological Laboratory of Rochester Homeopathic Hospital	......	......	......	......	....	9,161
Utica — Clarke Memorial Laboratory	......	......	......	......	....	1,015
Yonkers — St. Joseph's Hospital Clinical Laboratory	......	......	......	......	....	996

STATEMENT OF DIAGNOSTIC EXAMINATIONS — (*Concluded*)

	1915	1916	1917	1918	1919	1920
INSTITUTIONAL LABORATORIES						
Binghamton — Binghamton State Hospital Laboratory						1,915
Clifton Springs — Laboratory of the Clifton Springs Sanatorium; also county, municipal and private work						16,995
Pomona — Rockland County Tuberculosis Hospital Laboratory; also county and private work						1,527
Poughkeepsie — Laboratory of Hudson River State Hospital				1,806	2,120	4,729
Saranac Lake — Saranac Laboratory for the Study of Tuberculosis; also municipal and private work						3,692
Sonyea — Craig Colony Laboratory						917
Trudeau — Trudeau Sanatorium Research and Clinical Laboratory						4,699
White Plains — Bloomingdale Hospital Laboratory; also private work						2,996
PRIVATE LABORATORIES						
Albany — Bender Hygienic Laboratory; also hospital and municipal work	9,836	12,398	14,583	5,557	17,483	22,620
Amsterdam — Laboratory of Dr. Lew H. Finch						5,233
Auburn — Laboratories of Chemical and Microscopical Diagnosis						569
Binghamton — Nelson & Lauder Laboratory; also municipal work			5,620	4,653	4,967	5,030
Binghamton — Kilmer Pathological Laboratory					826	4,002
Clayton — Clayton Laboratory						307
Dobbs Ferry, New Rochelle, White Plains — von Wedel Laboratories; also institutional work	4,143	7,229	6,766	7,217	11,717	16,729
Jamaica — Jamaica Laboratories; also county work						720
Mamaroneck — Cappus Laboratories; also county, hospital and municipal work				2,213	2,726	8,015
Peekskill — Lent Clinical Laboratory						1,107
Poughkeepsie — Laboratory of Dr. Sanderson						217
Rochester — Laboratory of Dr. Boswell						41
Rochester — Medical Laboratory of Dr. G. W. O'Grady						1,067
Tuxedo Park — Tuxedo Laboratory; also hospital and municipal work	1,521	1,642	1,535	840	1,195	2,384
Watertown — Calkins & Farmer Laboratory; also county and municipal work					303	6,365
Watertown — Isabel M. Meader Laboratory						2,611
Yonkers — Sloan Laboratory						394
APPROVED LABORATORIES — NEW YORK CITY						
Horstman Laboratory, (Fordham University College Pharmacy)						65
Laboratory of the Hospital for Ruptured and Crippled						27
St. Mark's Clinical and X-Ray Laboratories						1,396
Clinical Laboratory of Frederic E. Sondern						960
Sero Pathological Laboratory						2,882
T. S. Winslow Laboratory						1,209

SANITARY ANALYSES

	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Bacterial	1,175	1,056	1,584	2,131	2,800	2,017	1,091	1,447	1,352	1,189	1,140	911	1,030
Chemical	626	646	1,097	1,850	2,400	2,507	703	661	626	532	541	455	533

The decrease in the number of sanitary analyses since 1914 is due to the fact that careful field inspections on all samples of water sent to the laboratory for examination were then required for the first time.

ANALYTICAL RESULTS OF SAMPLES OF WATER OBTAINED FROM PUBLIC SUPPLIES OR SUPPLIES USED BY PUBLIC INSTITUTIONS

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Akron	Raw water from intake well, public supply	10/ 2/20	....	....	....	....	....	....	....	....	....	....	....	....	32,000	+	+	—	...
Akron	Tap at pumping station, chlorinated water, public supply	10/ 2/20	....	....	....	....	....	....	....	....	....	....	....	....	36,000	+	+	—	...
Akron	Tap, public supply	10/ 2/20	Trace	0	....	....	.030	.028	.040	.080	25.50	1011.5	221.00	1.45	275	+	—	—	...
Albany	Tap, public supply	10/27/20	35	0	....	....	.002	.052	.008	.080	4.60	84.30	63.00	17.20	9	—	—	—	...
Albion (Western House of Refuge)	Tap in operating room	2/ 6/20	10	Trace	....	....	.012	.136	Trace	2.00	13.00	200.00	172.00	4.80	35	—	—	—	...
Albion (Western House of Refuge)	Tap in kitchen at hospital	2/ 6/20	....	....	....	....	....	....	....	....	....	....	....	....	30	—	—	—	...
Albion (Western House of Refuge)	Tap at Honor cottage	2/ 6/20	....	....	....	....	....	....	....	....	....	....	....	....	45	—	—	—	...
Albion (Western House of Refuge)	Well at farm-house	2/ 6/20	....	....	....	....	....	....	....	....	....	....	....	....	5	—	—	—	...
Albion (Western House of Refuge)	Well at B. A. Conrad's residence	7/12/20	0	10	....	....	.002	.064	.003	8.00	48.00	373.50	335.00	2.40	4,900	+	+	+	...
Albion (Western House of Refuge)	Raw water before any treatment, public supply	10/21/20	15	10	....	....	.068	.412	.005	.140	10.00	314.50	161.00	13.50	1,600	+	+	—	...
Albion (Western House of Refuge)	Water after treatment with alum sulphate no hypo, public supply	10/21/20	....	....	....	....	....	....	....	....	....	....	....	....	1,800	+	+	+	...
Albion (Western House of Refuge)	Water after treatment ready for use, public supply	10/21/20	....	....	....	....	....	....	....	....	....	....	....	....	13,500	+	+	—	...
Albion (Western House of Refuge)	Tap, public supply	10/21/20	5	Trace	....	....	.022	.176	.020	.300	13.50	200.00	122.50	4.90	17,000	+	+	+	...
Alfred	Tap, public supply	12/10/20	0	0	....	....	.002	.026	.000	.400	1.40	156.00	......	.60	8,700	+	—	—	...
Amenia	Well supply, public supply	6/11/20	0	Trace	....	....	.006	.020	.002	1.00	38.00	264.50	211.00	.20	9,200	—	—	—	...

Amenia	Spring supply, public supply	6/11/20	0	0	....	....	.002	.024	.001	.020	1.40	31.20	17.00	.60	1,200	—	—	—	...
Amenia	Tap, public supply	6/11/20	....	....	....	....	....	....	....	....	....	....	....	....	10,000	+	+	—	...
Amsterdam	Hydrant A	9/23/20	....	....	....	....	....	....	....	....	....	....	....	....	26,500	+	—	—	...
Amsterdam	Hydrant B	9/23/20	....	....	....	....	....	....	....	....	....	....	....	....	50,000	+	—	—	...
Amsterdam	Tap at room 20, finishing department, McCleary, Wallin & Crounse mill	11/18/20	40	5	....	....	.002	.094	.008	.060	2.80	80.00	61.00	8.10	275	+	+	+	...
Amsterdam	Tap at Chenille finishing No. 1 building, McCleary, Wallin & Crounse mill	11/18/20	....	....	....	....	....	....	....	....	....	....	....	....	1,200	+	+	+	...
Amsterdam	Hydrant at Forest and Gate house, McCleary, Wallin & Crounse mill	11/18/20	....	....	....	....	....	....	....	....	....	....	....	....	250	+	+	—	...
Amsterdam	Tap at barber shop, corner Main and Market streets, public supply	11/18/20	....	....	....	....	....	....	....	....	....	....	....	....	10	+	—	—	...
Amsterdam	Tap at building No. 17, McCleary, Wallin & Crounse mill	11/19/20	....	....	....	....	....	....	....	....	....	....	....	....	60	+	—	—	...
Amsterdam	Tap at first floor building No. 1, Chenille, McCleary, Wallin & Crounse mill	11/19/20	....	....	....	....	....	....	....	....	....	....	....	....	170	+	—	—	...
Amsterdam	Tap at Axminster building No. 8, McCleary, Wallin & Crounse mill	11/19/20	....	....	....	....	....	....	....	....	....	....	....	....	150	+	—	—	...
Amsterdam	Tap at barber shop, 54 Lyon avenue, public supply	11/19/20	....	....	....	....	....	....	....	....	....	....	....	....	50	+	+	—	...
Amsterdam	Tap at Wilson's drug store, public supply	11/19/20	60	Trace	....	....	.002	.090	.007	.040	1.60	22.10	9.00	16.00	35	+	+	—	...
Amsterdam	Tap at finishing department building No. 20, McCleary, Wallin & Crounse mill	11/27/20	50	10	....	....	.002	.104	.010	.020	1.10	14.30	7.00	14.80	....	...	...	...	...
Amsterdam	Tap at barber shop, 54 Lyon avenue, public supply	11/27/20	....	....	....	....	....	....	....	....	....	....	....	....	1,400	+	+	+	...
Amsterdam	Tap at Sanford homestead building	11/27/20	....	....	....	....	....	....	....	....	....	....	....	....	900	+	—	—	...
Amsterdam	Tap at Chenille building, finishing department No. 1, McCleary, Wallin & Crounse mill	11/27/20	....	....	....	....	....	....	....	....	....	....	....	....	75	+	+	+	...
Amsterdam	Tap third floor, building No. 20, McCleary, Wallin & Crounse mill	12/ 1/20	....	....	....	....	....	....	....	....	....	....	....	....	275	+	—	—	...
Amsterdam	Tap, third floor, building No. 20, McCleary, Wallin & Crounse mill	12/ 1/20	....	....	....	....	....	....	....	....	....	....	....	....	160	+	+	+	...
Amsterdam	Hydrant, Forest and Gate house, McCleary, Wallin & Crounse mill	12/ 1/20	....	....	....	....	....	....	....	....	....	....	....	....	230	+	+	+	...
Amsterdam	Tap at barber shop, 54 Lyon avenue, public supply	12/ 1/20	....	....	....	....	....	....	....	....	....	....	....	....	160	+	+	—	...
Amityville	Pump, Amityville Water Works Co.	5/ 7/20	....	....	....	....	....	....	....	....	....	....	....	....	36	—	—	—	...
Amityville	Pump, Amityville Water Works Co.	5/ 7/20	....	....	....	....	....	....	....	....	....	....	....	....	48	—	—	—	...
Amityville	Pump, Amityville Water Works Co.	5/ 7/20	....	....	....	....	....	....	....	....	....	....	....	....	33	—	—	—	...
Amityville	Well overflow from stand pipe, public supply	5/12/20	....	....	....	....	....	....	....	....	....	....	....	....	45	—	—	—	...
Amityville	Leakage from stand pipe, public supply	5/12/20	....	....	....	....	....	....	....	....	....	....	....	....	60	+	—	—	...
Amityville	Tap at pumping station, public supply	5/12/20	....	....	....	....	....	....	....	....	....	....	....	....	275	—	—	—	...
Amityville	Tap in water office, public supply	5/12/20	....	....	....	....	....	....	....	....	....	....	....	....	100	—	—	—	...
Amityville	Tap near pumping station, public supply	5/26/20	0	0	....	....	.076	.002	.010	1.40	10.00	37.70	25.00	.20	....	...	...	...	...
Amityville	Tap on motor driven pump, public supply	6/ 4/20	0	0	....	....	.076	.010	.001	1.60	10.00	36.40	10.00	.60	20,000	—	—	—	...

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Continued*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Amityville	Northwest well surface leakage	6/ 4/20	...	...	...	...	...	...	...	...	...	...	...	...	2,600	+	+	—	...
Angola	Raw Lake Erie water, public supply	12/17/20	...	...	...	...	...	...	...	...	...	...	...	...	17,000	+	+	+	...
Angola	Water before filtration, public supply	12/17/20	...	...	...	...	...	...	...	...	...	...	...	...	8,100	+	+	—	...
Angola	Filtered water, public supply	12/17/20	10	90	...	...	.006	.092	.010	.200	12.00	102.80	86.00	3.30	26,000	+	+	+	...
Antwerp	Water from public supply often passing through Pasteur filter	10/25/20	...	...	...	...	...	...	...	...	...	...	...	...	30	—	—	—	...
Antwerp	Tap, public supply	10/25/20	50	Trace	...	...	.002	.116	.005	.060	1.60	57.10	49.00	12.00	12,000	+	+	+	...
Attica	Raw water at filter plant, public supply	12/31/20	3	0	...	...	.008	.084	.002	.400	2.00	65.70	60.00	4.60	1,100	+	—	—	...
Attica	Filtered water at old filter, public supply	12/31/20	3	0	...	...	.010	.096	.002	.400	2.00	78.60	68.00	3.00	4,900	+	+	—	...
Attica	Filtered water at new filter, public supply	12/31/20	...	...	...	...	...	...	...	...	...	...	...	...	1,300	+	+	—	...
Attica	Tap, public supply	12/31/20	...	...	...	...	...	...	...	...	...	...	...	...	3,800	+	—	—	...
Auburn	Tap, public supply	12/ 8/20	0	0	...	...	.002	.038	.005	.300	2.00	169.00	103.00	1.30	2,700	—	—	—	...
Auburn	Raw water at filter plant, public supply	12/22/20	Trace	0	...	...	.008	.060	.003	.300	2.30	108.60	106.00	1.80	3,000	—	—	—	...
Auburn	Filtered water at lower pump station, public supply	12/22/20	0	0	...	...	.002	.038	Trace	.500	2.40	105.80	103.00	1.50	750	—	—	—	...
Auburn	Tap at water office, public supply	12/22/20	...	...	...	...	...	...	...	...	...	...	...	...	10	—	—	—	...
Auburn (Auburn prison)	Well at house No. 1, prison farm	12/28/20	0	0	...	...	.002	.038	Trace	5.60	15.00	422.00	393.00	.30	6,000	—	—	—	...
Auburn (Auburn prison)	Well at house No. 2, prison farm	12/28/20	0	0	...	...	.010	.036	Trace	4.80	30.00	338.00	301.00	1.10	8,800	+	—	—	...
Auburn (Auburn prison)	Well near pasture, prison farm	12/28/20	...	...	...	...	...	...	...	...	6.00	...	...	...	1,900	+	—	—	...
Auburn (Auburn prison)	Well at Remington house, prison farm	12/28/20	0	0	...	...	.002	.040	.003	9.60	92.50	403.00	330.00	1.00	16,000	—	—	—	...
Auburn (Auburn prison)	Well at Remington barn, prison	12/28/20	...	...	...	...	...	...	...	...	31.00	...	...	...	8,200	+	+	—	...
Avoca	Upper spring reservoir, public supply	12/17/20	0	3	...	...	.016	.058	.015	.100	2.20	131.40	122.00	2.90	4,900	—	—	—	...
Avoca	Lower spring, public supply	12/17/20	...	...	...	...	...	...	...	...	4.00	...	...	...	49,000	—	—	—	...
Avoca	Creek, public supply	12/17/20	...	...	...	...	...	...	...	...	...	...	...	...	4,900	+	—	—	...
Avoca	Tap, public supply	12/17/20	...	...	...	...	...	...	...	...	...	...	...	...	5,500	—	—	—	...
Babylon	Tap at pumping station, public supply	5/25/20	0	0	...	...	.072	.016	.001	.800	6.00	20.80	6.00	.10	128	—	—	—	...
Babylon	Tap in village, public supply	5/25/20	...	...	...	...	...	...	...	...	...	...	...	...	1,300	—	—	—	...
Baldwin	Tap at pumping station, public supply	5/21/20	...	...	...	...	...	...	...	...	...	...	...	...	10,000	—	—	—	...
Baldwin	Tap at railroad station, public supply	5/21/20	0	Trace	...	...	.008	.034	.002	2.80	10.00	41.60	14.00	.40	20,000	—	—	—	...
Baldwinsville	Fountain at pumping station, public supply	6/ 1/20	...	...	...	...	...	...	...	...	...	...	...	...	140	—	—	—	...

Baldwinsville	Tap at Dr. Sullivan's residence, public supply	6/ 1/20	0	0			.002	.014	.000	1.00	3.20	201.50	182.00	.80	40,500	—	—	—	...
Barker	Tap, public supply	6/14/20	5	Trace			.002	.038	.000	.100	10.80	84.30	72.00	1.60	350	—	—	—	...
Batavia (New York State School for the Blind)	Pump on second floor, cistern supply	1/16/20	5	Trace			.008	.056	.001	.600	3.00	148.60	86.00	1.50	5	+	—	—	...
Batavia (New York State School for the Blind)	Tap in main kitchen, drinking water filtered through N. Y. Continental Jewel Filter	1/16/20	0	Trace			.030	.058	Trace	.600	4.00	199.20	117.00	.80	5	—	—	—	...
Batavia (New York State School for the Blind)	Utility supply, Jewel Continental filter	1/16/20													5	—	—	—	...
Batavia (New York State School for the Blind)	Tap in kindergarten filtered through Paddock filter	1/16/20													5	—	—	—	...
Batavia	Tap, public supply	11/29/20													4	—	—	—	...
Batavia	Tap, public supply	11/29/20													50	—	—	—	...
Batavia	Tap at No. 1 Hall Park, public supply	11/29/20	Trace	Trace			.002	.050	.002	.500	4.10	122.80	71.00	2.55					...
Batavia	Tap at No. 16 Kingsbury avenue, public supply	11/29/20	Trace	Trace			.002	.044	.002	.600	3.50	98.60	60.00	2.10					...
Bath (New York State Soldiers' and Sailors' Home)	Wells	7/ 9/20	0	0			.006	.014	.000	.020	4.00	162.50	144.00	1.00	23,500	—	—	—	...
Bath (New York State Soldiers' and Sailors' Home)	Mixture of three springs	7/ 9/20													15,500	—	—	—	...
Bath (New York State Soldiers' and Sailors' Home)	Tap at farmer's house	7/ 9/20	0	0			.002	.004	Trace	2.00	2.40	182.00	156.00	.70	4,700	—	—	—	...
Bath (New York State Soldiers' and Sailors' Home)	Tap at hospital	7/ 9/20													19,000	—	—	—	...
Bath (New York State Soldiers' and Sailors' Home)	Tap, public supply	7/ 9/20	10	0			.006	.012	.000	.400	3.80	188.50	169.00	.60	650	—	—	—	...
Bay Shore	Tap at pumping station public supply	5/29/20	0	0			.006	.004	.000	1.40	9.00	14.30	5.00	.10	81	—	—	—	...
Bay Shore	Tap in village, public supply	5/29/20													3,400	—	—	—	...
Beacon (Matteawan State hospital)	Tap in pharmacy	2/26/20	0	0			.002	.020	.001	.300	18.00	507.00	199.00	1.20	25	+	—	—	...
Beacon (Matteawan State hospital)	Tap in Van Tine's store	2/26/20	0	Trace			.002	.016	.000	.040	2.00	27.30	7.00	1.20	35	—	—	—	...
Bedford (State Reformatory for Women)	Tap in Administration building	2/28/20	0	Trace			.008	.040	Trace	.600	6.00	81.40	57.00	2.20					...
Bellport	Tap, hot water in kitchen at F. H. Holmes' residence, public supply	5/19/20													2	—	—	—	...
Bellport	Tap, cold water in kitchen at F. H. Holmes' residence, public supply	5/19/20													3	—	—	—	...
Bellport	Tap in bath room at F. H. Holmes' residence, public supply	5/19/20													2	—	—	—	...
Bellport	Tap, cold water in lavatory at F. H. Holmes' residence, public supply	5/19/20													6	—	—	—	...
Bellport	Tap, cold water in pantry at F. H. Holmes' residence, public supply	5/19/20													7	—	—	—	...
Berlin	Kendall pond supply, public supply	10/11/20	60	0			.002	.164	.003	.06	1.40	12.70	10.00	11.80	100	+	+	—	...
Berlin	Spring supply, public supply	10/11/20	Trace	Trace			.002	.036	.002	.04	.60	20.80	18.00	1.30	60	+	+	—	...

ANALYTICAL RESULTS OF SAMPLES OF WATER — (Continued)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Berlin	Tap, public supply	10/11/20	...	...	...	...	...	...	...	...	...	...	...	...	110	—	—	—	...
Binghamton (State hospital)	Raw river water	3/13/20	10	20	...	...	.028	.110	.003	.600	2.00	44.30	27.00	2.50	11,000	+	+	+	...
Binghamton (State hospital)	Tap at Parkhurst cottage, well supply	3/13/20	0	0	...	...	.066	.038	.007	5.00	7.00	41.60	9.00	.30	700	—	—	—	...
Binghamton (State hospital)	Tap at Morningside cottage, well supply	3/13/20	0	0	...	...	.204	.010	.001	.100	2.80	162.50	...	1.20	5	—	—	—	...
Binghamton (State hospital)	Tap at Orchard house, well supply	3/13/20	0	Trace	...	...	.194	.026	.001	.300	88.00	29.90	...	.80	500	—	—	—	...
Binghamton (State hospital)	Tap, effluent from filters	3/13/20	0	0	...	...	.006	.042	.001	.600	11.00	92.90	44.00	1.30	1,500	+	+	—	...
Bolton Landing	Bolton creek, public supply	2/10/20	...	...	...	...	...	...	...	...	...	...	...	...	100	—	—	—	...
Bolton Landing	Tap, Lake George water, public supply	2/10/20	...	...	...	...	...	...	...	...	...	...	...	...	8	—	—	—	...
Brasher Falls	Storage tank, public supply	11/23/20	50	Trace	...	...	.028	.104	.006	.100	1.40	22.10	16.00	11.80	1,100	+	+	—	...
Briarcliff Manor	Well No. 1, public supply	9/11/20	...	...	...	...	...	...	...	...	4.00	...	...	...	38,000	+	—	—	...
Briarcliff Manor	Well No. 2, public supply	9/11/20	...	...	...	...	...	...	...	...	4.00	...	...	...	13,000	—	—	—	...
Briarcliff Manor	Well No. 3, public supply	9/11/20	...	...	...	...	...	...	...	...	7.50	...	...	...	250,000	+	—	—	...
Briarcliff Manor	Well No. 4, public supply	9/11/20	...	...	...	...	...	...	...	...	3.00	...	...	...	5,700	+	—	—	...
Briarcliff Manor	Well No. 5, public supply	9/11/20	...	...	...	...	...	...	...	...	4.50	...	...	...	2,400	—	—	—	...
Briarcliff Manor	Well No. 6, public supply	9/11/20	...	...	...	...	...	...	...	...	3.00	...	...	...	1,200	+	—	—	...
Briarcliff Manor	Well No. 7, public supply	9/11/20	...	...	...	...	...	...	...	...	4.50	...	...	...	2,150	—	—	—	...
Briarcliff Manor	Well No. 8, public supply	9/11/20	...	...	...	...	...	...	...	...	8.00	...	...	...	27,500	—	—	—	...
Briarcliff Manor	Well No. 9, public supply	9/11/20	...	...	...	...	...	...	...	...	13.50	...	...	...	28,000	—	—	—	...
Briarcliff Manor	Tap at pumping station, public supply	9/11/20	5	0	...	...	.002	.008	.002	.300	3.60	98.60	79.50	1.25	...	...	...	...	...
Briarcliff Manor	Well No. 1, public supply	11/15/20	Trace	Trace	...	...	.002	.004	.001	.060	3.20	125.80	90.00	1.95	65	—	—	—	...
Briarcliff Manor	Well No. 2, public supply	11/15/20	Trace	Trace	...	...	.002	.002	.002	.180	2.60	98.60	69.00	1.85	200	—	—	—	...
Briarcliff Manor	Well No. 3, public supply	11/15/20	2	10	...	...	.024	.002	.001	.180	10.00	128.60	102.50	1.85	130	+	+	—	...
Briarcliff Manor	Well No. 4, public supply	11/15/20	5	0	...	...	.002	.074	.001	.300	3.40	88.60	65.50	1.50	460	+	—	—	...
Briarcliff Manor	Well No. 5, public supply	11/15/20	0	Trace	...	...	.002	.002	.001	.320	3.60	90.00	53.50	2.80	275	—	—	—	...
Briarcliff Manor	Well No. 6, public supply	11/15/20	5	5	...	...	.006	.002	.001	.020	3.30	137.20	91.50	.85	48	—	—	—	...
Briarcliff Manor	Well No. 7, public supply	11/15/20	5	20	...	...	.200	.052	.008	.200	4.40	101.50	36.50	5.10	32	—	—	—	...
Briarcliff Manor	Well No. 8, public supply	11/15/20	Trace	Trace	...	...	.070	.008	.001	.120	6.70	151.40	121.50	1.90	1	—	—	—	...
Briarcliff Manor	Well No. 9, public supply	11/15/20	Trace	2	...	...	.002	.002	.001	.120	13.00	131.40	93.50	1.20	5	+	—	—	...
Briarcliff Manor	Tap at pumping station, public supply	11/15/20	5	10	...	...	.050	.014	.007	.180	6.10	134.20	83.00	1.60	...	...	...	...	...
Bridgehampton	Tap, public supply	6/22/20	...	...	...	...	...	...	...	...	...	...	...	...	2	—	—	—	...
Bridgehampton	Pumphouse	6/22/20	...	...	...	...	...	...	...	...	...	...	...	...	2,750	—	—	—	...
Bridgehampton	Three driven wells, public supply	6/24/20	0	0	...	...	.030	.006	.002	5.00	21.00	38.00	10.00	1.30	...	...	...	...	...
Brockport	Tap, public supply	10/18/20	5	0	...	...	.002	.048	.001	.080	11.00	108.60	89.00	2.15	1,200	—	—	—	...

Brooklyn (State hospital)	Tap	11/ 9/20	Trace	0	.....	.....	.002	.004	.007	5.00	75.00	191.40	96.00	.65	0	—	—	—	...
Brooklyn (State hospital)	Tap at Creedmoore farm	11/ 9/20	Trace	0	.....	.....	.002	.002	.002	5.00	11.00	40.30	24.50	.65	0	—	—	—	...
Buffalo (State hospital)	Raw water before softening	4/ 5/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,700	—	—	—	...
Buffalo	Tap at Col. F. G. Ward pumping station, public supply	4/ 5/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	140	—	—	—	...
Buffalo	Tap at La Fayette hotel, public supply	4/ 5/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	—	—	—	...
Buffalo	Tap at Dr. Clark's office, public supply	4/ 5/20	Trace	15	.....	.....	.008	.068	Trace	.100	10.00	92.90	89.00	1.20	.....	...	...	...	...
Buffalo (State hospital)	Softened water	10/25/20	Trace	20	.....	.....	.002	.028	.002	.040	11.00	60.00	48.50	1.25	20	—	—	—	...
Buffalo (State hospital)	Tap at Staff cottage, pressure filtered water	10/25/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,300	—	—	—	...
Buffalo (State hospital)	Tap, electricalized and filtered water	10/25/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,200	—	—	—	...
Buffalo	Tap, public supply	10/25/20	Trace	Trace	.....	.....	.002	.056	.001	.060	11.00	102.80	86.50	2.25	290	+	—	—	...
Cadosia	Tap, spring supply	5/26/20	0	0	.....	.....	.002	.018	.000	Trace	1.40	35.10	20.00	.10	6,300	—	—	—	...
Cadosia	Tap at restaurant, public supply	5/26/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17,500	+	+	+	...
Callicoon	Tap, public supply	6/19/20	0	0	.....	.....	.002	.002	.000	.200	1.00	22.10	14.00	.50	50,000	+	+	—	...
Canastota	Tap, public supply	3/27/20	5	20	.....	.....	.008	.068	.012	1.00	2.40	343.00	148.00	1.20	11,500	+	+	—	...
Canton	Callar spring at intake, public supply	7/12/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	120,000	+	+	—	...
Canton	Barringer spring at intake, public supply	7/12/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54,000	+	+	—	...
Canton	East line of springs at reservoir, public supply	7/12/20	5	0	.....	.....	.004	.024	.003	1.00	.80	90.00	81.00	1.80	46,000	+	+	+	...
Canton	West line of spring at reservoir, public supply	7/12/20	5	20	.....	.....	.006	.030	Trace	1.00	1.40	125.80	112.00	1.70	62,000	—	—	—	...
Canton	Tap at American House, public supply	7/12/20	10	0	.....	.....	.010	.050	Trace	.600	1.40	105.80	89.00	2.00	6,000	—	—	—	...
Canton	Water from old stand pipe, not cleaned out, public supply	7/12/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	—	—	—	...
Canton	Water from old stand pipe, has been cleaned out, public supply	7/12/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	700	—	—	—	...
Castleton	Tap, public supply	6/ 4/20	Trace	0	.....	.....	.002	.068	.001	.300	1.60	122.80	104.00	1.40	60	+	+	—	...
Central Islip (State hospital)	Tap in kitchen No. 3, South Colony water supply	4/ 8/20	0	0	.....	.....	.002	.004	.000	.060	5.00	24.70	7.00	.50	5	—	—	—	...
Central Islip (State hospital)	Tap in kitchen No. 1, North Colony water supply	4/ 8/20	15	Trace	.....	.....	.002	.002	.000	.200	8.00	81.40	3.00	.50	5	—	—	—	...
Chatham	Pump discharge, public supply	1/12/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	—	—	—	...
Chatham	Tap at R. R. station, public supply	1/12/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	—	—	—	...
Chatham	Tap, public supply	1/12/20	0	0	.....	.....	.002	.018	Trace	5.00	15.00	94.20	62.00	1.00	5	—	—	—	...
Chatham	Reservoir, public supply	9/15/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	170	+	—	—	...
Chatham	Tap at pumping station, public supply	9/15/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7,000	—	—	—	...
Chatham	Tap, public supply	9/15/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	—	—	—	...
Chatham	Tap at Seymour's drug store, public supply	9/17/20	0	0	.....	.....	.002	.002	.001	5.00	26.00	88.60	62.50	.10	.....	...	...	...	...
Chatham	Palmer well, public supply	12/ 2/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	—	—	—	...
Chatham	Reservoir, public supply	12/ 2/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100	+	—	—	...
Chatham	Tap, public supply	12/ 2/20	8	2	.....	.....	.028	.022	Trace	5.00	15.00	122.80	69.00	1.20	5	—	—	—	...
Chatham	Tap at B. & A. depot, public supply	12/ 2/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	—	—	—	...
Cherry Valley	Tap, public supply	1/ 7/20	0	0	.....	.....	.002	.016	.000	.400	1.00	168.60	168.00	.20	70	—	—	—	...
Cincinnatus	Tap, public supply	6/ 5/20	5	10	.....	.....	.026	.136	.002	.100	.60	157.20	141.00	2.20	35	—	—	—	...
Clifton Springs	Tap, west hill, public supply	12/24/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	110	—	—	—	...
Clifton Springs	Tap, Basshart, public supply	12/24/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	275	—	—	—	...
Clifton Springs	Flow spring No. 3, public supply	12/24/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,200	—	—	—	...

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Continued*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Clifton Springs	Flow spring No. 1, No. 2, public supply	12/24/20													21,000	—	—	—	
Clifton Springs	Collecting basin, public supply	12/24/20													13,000	—	—	—	
Clifton Springs	Tap, public supply	12/24/20	0	5			.002	.046	Trace	2.80	4.60	257.00	243.00	1.50					
Cohocton	Collecting well, public supply	12/17/20	5	15			.038	.164	.005	.700	2.40	39.00	30.00	4.70	53,000	+	+	+	
Cohocton	Spring No. 2, public supply	12/17/20									3.00				27,000	+	+	+	
Cohocton	Spring No. 3, public supply	12/17/20									3.50				89,500	+	+	—	
Cohocton	Creek, public supply	12/17/20													78,000	+	+	+	
Cohoes	Raw water from power canal, public supply	7/ 1/20	25	20			.114	.220	.015	.200	3.80	76.70	65.00	6.50	3,700	+	+	+	
Cohoes	Applied water from top of filters, public supply	7/ 1/20													170	+	—	—	
Cohoes	Effluent of sedimentation basin, public supply	7/ 1/20	35	15			.044	.220	.015	.200	3.80	80.00	63.00	6.30	120	+	+	—	
Cohoes	Filtered and treated water at filter plant, public supply	7/ 1/20	15	Trace			.040	.134	.00	.240	4.40	80.00	61.00	5.00	15	—	—	—	
Cohoes	Tap at D. & H. R. R. station, public supply	7/ 1/20													225	+	+	—	
Town of Collins (Gowanda State hospital)	Tap	1/26/20													45	—	—	—	
Town of Collins (Gowanda State hospital)	New well	9/21/20	7	25			.164	.054	.004	.060	3.70	201.50	191.00	4.00					
Town of Collins (Gowanda State hospital)	Spring ½ mile west of Taylor Hollow	10/27/20	0	0			.002	.010	.001	.060	2.40	190.00	167.00	.70					
Town of Collins (Gowanda State hospital)	North branch, Clear creek near Marshfield	11/ 9/20	25	5			.002	.118	.002	.080	6.20	75.70	53.00	6.80					
Town of Collins (Gowanda State hospital)	Stream ½ mile west of Taylor Hollow	11/ 9/20	Trace	3			.002	.070	.002	.020	2.20	185.80	169.00	3.85					
Town of Collins (Gowanda State hospital)	Clear creek, north branch	12/ 8/20													3,000	+	+	—	

Town of Collins (Gowanda State hospital)	Well No. 1, at point 200 feet northeast, Clear creek and about 500 feet west, north branch	12/ 8/20	0	25	....	....	.004	.004	.005	Trace	1.60	208.00	189.00	1.50	....	...	...	...	...
Town of Collins (Gowanda State hospital)	Well No. 2, near southwest corner Wilbur, White's meadow	12/ 8/20	0	50	....	....	.002	.030	.009	.020	3.80	162.50	57.00	4.00	5,700	+	+	—	...
Town of Collins (Gowanda State hospital)	Well No. 3, at a point about 50 feet from the southwesterly side of Southern creek, opposite a small spring in Indian Reservation	12/ 8/20	0	125	....	....	.002	.080	.007	.020	2.40	190.00	152.00	4.40	8,000	+	+	+	+
Town of Collins (Gowanda State hospital)	Well No. 4, from a point between north and south branches of Clear creek, 1,000 feet above junction	12/ 8/20	0	550	....	....	.022	.424	.007	.020	3.00	300.00	247.00	23.00	....	...	...	...	...
Town of Collins (Gowanda State hospital)	Drilled well, 47 feet	12/17/20	5	200	....	....	.320	.020	.010	Trace	3.40	201.50	191.00	7.10	....	...	...	...	...
Comstock (Great Meadow prison)	Dolph pond	6/ 1/20	5	5	....	....	.014	.074	.001	.040	.80	31.20	16.00	2.80	500	—	—	—	...
Comstock (Great Meadow prison)	Tap, water from artesian well	6/ 1/20	0	Trace	....	....	.002	.012	.002	.020	1.60	321.50	316.00	.10	5	—	—	—	...
Comstock (Great Meadow prison)	Spring at Warden's residence	6/ 1/20	....	....	....	....	....	....	....	....	2.00	....	....	....	160	—	—	—	...
Conifer	Reservoir, public supply	9/21/20	60	Trace	....	....	.002	.064	.004	.100	1.20	19.50	19.00	12.00	50,000	+	+	—	...
Conifer	Dug well No. 2, public supply	9/21/20	....	....	....	....	....	....	....	....	8.00	....	....	....	4,800	—	—	—	...
Conifer	Dug well, No. 3, public supply	9/21/20	60	Trace	....	....	.002	.148	.002	.100	1.10	15.60	9.50	14.00	19,000	+	+	+	...
Conifer	Dug well No. 4, public supply	9/21/20	7	Trace	....	....	.002	.012	.004	6.00	12.00	40.30	13.50	1.40	33,000	+	+	—	...
Conifer	Dug well No. 2, near boarding house	9/21/20	....	....	....	....	....	....	....	....	....	....	....	....	5	—	—	—	...
Conifer	Dug well near planing mill	9/21/20	....	....	....	....	....	....	....	....	1.50	....	....	....	70	—	—	—	...
Conifer	Dug well near lumber yard	9/21/20	....	....	....	....	....	....	....	....	5.50	....	....	....	3,100	—	—	—	—
Conifer	Impounding reservoir, public supply	9/29/20	....	....	....	....	....	....	....	....	1.50	....	....	....	950	+	+	—	...
Conifer	Tap, public supply	9/29/20	....	....	....	....	....	....	....	....	1.50	....	....	....	750	+	+	—	...
Corning	Main spring, public supply	12/17/20	0	0	....	....	.002	.008	.001	2.00	7.80	192.00	165.00	.10	10	—	—	—	...
Corning	Tap at pumping station, chlorinated water, public supply	12/17/20	....	....	....	....	....	....	....	....	....	....	....	....	5	—	—	—	...
Corning	Tap, chlorinated water, public supply	12/17/20	....	....	....	....	....	....	....	....	....	....	....	....	5	—	—	—	...
Cortland	Tap at pumping station, public supply	12/13/20	0	0	....	....	.002	.002	.000	1.20	2.00	134.20	134.00	.80	....	—	—	—	...
Cuba	Tap, public supply	7/ 9/20	....	....	....	....	.004	.016	.000	.400	1.40	145.80	105.00	.40	10	+	—	—	...
Dannemora (Clinton prison)	Mine	5/15/20	5	Trace	....	....	.012	.086	.001	.100	.20	29.90	27.00	3.90	....	...	...	...	...
Dannemora (Clinton prison)	Mine	6/ 4/20	Trace	Trace	....	....	.012	.094	.002	.300	1.80	47.10	44.00	2.90	150	+	+	—	...
Dannemora (Clinton prison)	Driven well	6/ 4/20	Trace	20	....	....	.282	.108	.030	1.50	5.00	157.20	140.00	2.40	10,500	+	+	+	...
Dannemora (Clinton prison)	Shaft	6/ 4/20	0	Trace	....	....	.002	.020	.001	.300	2.40	77.10	77.00	1.10	2,500	—	—	—	...
Dannemora (Clinton prison)	Tap at lower reservoir, public supply	6/ 4/20	10	2	....	....	.008	.096	.001	.060	.40	42.90	42.00	3.00	90	+	—	—	...
Dannemora (Clinton prison)	Tap at upper reservoir, public supply	6/ 4/20	5	2	....	....	.014	.084	.001	Trace	.60	37.70	32.00	2.00	1,200	+	—	—	...
Dannemora (Clinton prison)	Tap, public supply	6/ 4/20	10	Trace	....	....	.004	.088	.001	.060	.60	36.40	31.00	4.70	275	—	—	—	...
Davenport	Tap, public supply	10/18/20	3	0	....	....	.002	.022	.001	.06	.40	22.10	22.00	.90	160	+	—	—	...

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Continued*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Delanson	Distributing reservoir, public supply	10/15/20													110	+	—	—	
Delanson	Tap, public supply	10/15/20	20	3			.002	.136	Trace	.08	.40	36.40	35.50	8.20	800	+	+	—	
Delevan	Emergency pond, public supply	9/23/20													136,000	+	+	—	
Delevan	Tap at Read & Co's. store, public supply	9/23/20	2	0			.002	.002	.001	.540	1.20	108.60	104.50	.80	330,000	+	+	—	
Delevan	Tap at Empire Type Co., public supply	9/23/20													120,000	+	+	—	
Depew	Tap, western New York Water Co., public supply	12/13/20													700	+	—	—	
Deposit	Raw intake water, public supply	5/24/20	5	Trace			.012	.050	.001	.140	.60	16.90	10.00	1.50	11,000	+	+	+	
Deposit	Upper reservoir, public supply	5/24/20	5	Trace			.056	.100	.001	.020	.60	14.30	7.00	2.20	1,900	—	—	—	
Deposit	Butler brook, just before entering reservoir, public supply	11/12/20	3	Trace			.002	.024	.002	.120	1.00	14.30	12.00	2.55	96,000	+	+	—	
Deposit	Tap, public supply	11/12/20	5	Trace			.002	.042	.002	.140	1.00	18.20	13.00	2.80	80,000	+	+	—	
Dobbs Ferry	Spring, public supply	1/12/20	0	Trace			.004	.036	Trace	3.00	11.00	160.00	123.00	1.40	22,000	+	+	+	
Dobbs Ferry	Well No. 2, public supply	1/12/20													31,500	+	+	+	
Douglaston	Tap at pumping station, Citizens' Water Co., public supply	5/13/20													37	+	—	—	
Dryden	Tap, sample A, public supply	11/20/20													1,400	+	—	—	
Dryden	Tap, sample B, public supply	11/20/20													700	+	—	—	
East Aurora	Cazenovia creek, above outlet, public supply	12/ 8/20													7,700	+	+	+	
East Aurora	Cazenovia creek, below outlet, Pine street station, public supply	12/ 8/20	5	30			.532	.264	.010	.500	2.60	72.90	65.00	7.00	230,000	+	+	+	+
East Aurora	Pine street station, public supply	12/18/20	5	5			.002	.034	.003	.060	3.40	205.60	185.00	2.40	5	—	—	—	
East Aurora	Reservoir, public supply	12/18/20	0	0			.002	.016	.003	2.00	9.00	255.00	224.00	.70	1,300	—	—	—	
East Aurora	Tap, public supply	12/18/20													10	—	—	—	
East Aurora	Railroad supply	12/18/20													5	—	—	—	
East Hampton	Tap at pumping station, public supply	6/ 8/20	0	0			.002	.002	.000	.500	14.00	14.30	9.00	.40	2	—	—	—	
East Moriches	Driven well of E. W. Raynor	4/30/20													800	—	—	+	
East Moriches	Driven well of E. W. Raynor	4/30/20													1,400	—	—	—	
East Moriches	Driven well of E. W. Raynor	4/30/20													1,000	—	—	—	
East Moriches	Driven well of E. W. Raynor	4/30/20													2,000	—	—	—	

East Syracuse	Tap at Pompey springs, public supply	12/17/20													25	—	—	—	
East Syracuse	Raw water composite sample at chlorination, public supply	12/17/20													3,500	+	+	—	
East Syracuse	Tap, chlorinated water, public supply	12/17/20													1,500	+	—	—	
East Syracuse	Tap in village, fire house, public supply	12/17/20	0	0			.002	.022	.002	2.00	2.60	221.50	214.00	.90	450	+	+	—	
East Worcester	Brook inlet to reservoir, public supply	7/17/20													210,000	+	+	—	
East Worcester	Brook at upper intake, public supply	7/17/20													135,500	+	+	—	
East Worcester	Raw water at filter plant, public supply	7/17/20	20	25			.010	.168	.002	.020	.20	78.60	28.00	4.60	4,800	—	—	—	
East Worcester	Filtered water at filter plant without alum, public supply	7/17/20	10	0			.004	.090	.003	.140	.20	33.80	32.00	3.00	48,500	+	—	—	
East Worcester	Filtered water treated with alum, public supply	7/17/20	5	0			.012	.104	.002	.100	.20	78.60	27.00	2.90	29,500	—	—	—	
East Worcester	Tap, public supply	7/17/20													52,000	+	+	+	
Elmhurst	Tap at pumping station, Citizens' Water Co., public supply	5/13/20													20	—	—	—	
Elmira	Main supply from city mains, public supply	12/ 4/20	0	0			.002	.046	.003	.300	4.00	67.10	33.00	2.00	60	+	+	—	
Elmira	Auxiliary supply	12/ 4/20	25	3			.020	.148	.008	.200	2.00	57.10	38.00	3.40	13,500	+	+	+	
Endicott	Tap at pumping station, public supply	5/18/20	0	Trace			.012	.014	.005	.060	10.00	134.20	130.00	.70	28,500	—	—	—	
Farmingdale	Large tilewell, off pump	6/ 9/20													7	—	—	—	
Farmingdale	Driven well supply	6/ 9/20	0	0			.018	.004	.001	1.40	8.00	12.70	8.00	.10	2,200	—	—	—	
Farmingdale	Tap, public supply	6/ 9/20													14	—	—	—	
Farmingdale (State Institute for Applied Agriculture)	Well at Ruland farm	7/12/20									3.00				800	—	—	—	
Farmingdale (State Institute for Applied Agriculture)	Well at Seaman farm	7/12/20									2.00				110	—	—	—	
Farmingdale(State Institute for Applied Agriculture)	Well, main supply	7/12/20	0	0			.008	.026	Trace	.080	4.20	9.50	9.00	.90	180	—	—	—	
Fayetteville	Small reservoir, public supply	12/17/20	0	0			.002	.020	.001	1.40	2.20	335.50	193.00	.90	375	—	—	—	
Fayetteville	Auxiliary supply, public supply	12/17/20													800	—	—	—	
Fayetteville	Tap at railroad station, public supply	12/17/20													25	—	—	—	
Fayetteville	Putnam spring, public supply	12/17/20	0	0			.006	.044	Trace	1.20	3.60	328.50	202.00	.20					
Fire Island (State park)	Well	9/ 8/20	0	0			.002	.014	.001	.020	20.00	14.30	14.00	1.00	1,300	—	—	—	
Fire Island (State park)	Tap at superintendent's residence	9/ 8/20	5	0			.002	.040	.001	.120	157.50	92.90	44.50	3.15	80	—	—	—	
Fisher's Island	Tap at post-office, public supply	6/28/20													5,750	—	—	—	
Fisher's Island	Pond untreated, public supply	6/28/20													110	+	—	—	
Fisher's Island	Tap at pump, treated water, public supply	6/28/20													5,750	—	—	—	
Fisher's Island	Sample A	7/ 6/20	40	3			.038	.184	.004	.060	48.00	20.80	11.00	6.80					
Floral Park	Tap at pump station No. 3, Jamaica Water Co.	5/29/20	0	0			.010	.004	.000	5.00	12.00	37.70	8.00	.10					
Fredonia	Tap, public supply	10/18/20	10	10			.002	.054	.011	0.14	2.00	92.90	76.50	3.00	800	+	—	—	
Freeport	Tap at pumping station, public supply	5/21/20	5	Trace			.002	.172	.002	3.50	14.00	51.40	3.00	.30	14	—	—	—	
Freeport	Tap in village, public supply	5/21/20													5,900	—	—	—	
Friendship	Drilled well, public supply	12/17/20									103.00				45	+	+	—	
Friendship	Dug well, public supply	12/17/20	0	0			.002	.006	.002	2.40	5.00	108.60	100.00	.50	45	+	—	—	
Friendship	Nile well supply, public supply	12/17/20													40	—	—	—	
Friendship	Spring supply, public supply	12/17/20	Trace	2			.010	.018	.001	.200	.80	44.30	39.00	.90	700	+	+	—	

ANALYTICAL RESULTS OF SAMPLES OF WATER — (Continued)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present, — = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Fulton	Well No. 2, public supply	6/ 1/20	0	0			.128	.028	.005	2.00	340.00	278.50	135.00	1.20	5	—	—	—	...
Fulton	Well No. 3, public supply	6/ 1/20	0	Trace			.056	.046	.003	.400	11.00	162.80	141.00	1.30	3	—	—	—	...
Fulton	Well No. 4, public supply	6/ 1/20									3.00				5	—	—	—	...
Fulton	Tap at pumping station, public supply	6/ 1/20													35,000	—	—	—	...
Fulton	Tap at Dr. Drury's office, public supply	6/ 1/20	0	0			.002	.004	.001	.800	115.00	140.00	109.00	.50	24,000	—	—	—	...
Fulton Chain	Spring brook, public supply	5/28/20													5,700	—	—	—	...
Fulton Chain	Tap at R. R. station, public supply	5/28/20	5	Trace			.002	.052	.000	.100	.80	19.50	19.00	2.10	50	—	—	—	...
Fulton Chain	Tap at Van Auken's hotel, public supply	5/28/20													1,000	—	—	—	...
Garden City	Tap at pumping station, public supply	6/15/20	0	0			.010	.002	.001	5.00	21.00	44.30	7.00	.10	14	—	—	—	...
Garden City	Tap at drug store, public supply	6/15/20													1,500	—	—	—	...
Garnerville	Raw water at Rockland Finishing Co., public supply	9/ 3/20	20	7			.188	.076	.016	.100	3.70	55.70	54.50	4.40	130,000	+	+	—	...
Garnerville	Filter effluent at Rockland Finishing Co., public supply	9/ 3/20	Trace	0			.140	.024	.002	.200	3.70	55.70	44.00	1.15	3,800	+	—	—	...
Garnerville	Filtered and chlorinated water at filter plant	9/ 3/20	5	0			.136	.024	Trace	.180	3.70	55.70	47.50	1.55	2	—	—	—	...
Geneva	Raw water at filter plant, public supply	12/22/20	0	0			.002	.056	.002	.500	74.00	105.80	102.00	1.80	650	—	—	—	...
Geneva	Filtered water from filter No. 1, public supply	12/22/20	0	0			.002	.042	Trace	.500	72.00	105.80	100.00	1.50	5	—	—	—	...
Geneva	Filtered water from filter No. 2, public supply	12/22/20													20	—	—	—	...
Geneva	Filtered water from filter No. 3, public supply	12/22/20													15	—	—	—	...
Geneva	Tap, public supply	12/22/20													20	—	—	—	...
Glen Cove	Tap on pump, public supply	6/16/20	0	0			.004	.002	.001	2.00	8.00	20.80	14.00	.10	690	—	—	—	...
Glen Cove	Tap at drug store, public supply	6/16/20													14,500	—	—	—	...
Glens Falls	Butler pond outlet, public supply	8/ 5/20	80	5			.004	.392	.004	.100	.40	12.70	10.00	11.00	230	+	—	—	...
Glens Falls	Stream tributary to Butler brook, below pond, public supply	8/ 5/20													2,100	+	+	—	...
Glens Falls	Outlet, Butler storage reservoir, public supply	8/ 5/20														+	+	—	...

Glens Falls	Wilkie storage reservoir, public supply	8/ 5/20													90	—	—	—	
Glens Falls	Wilkie brook, below tributary, public supply	8/ 5/20													120	+	—	—	
Glens Falls	Wilkie distributing reservoir, public supply	8/ 5/20													2,400	+	+	—	
Glens Falls	Keenan storage reservoir, public supply	8/ 5/20													30	—	—	—	
Glens Falls	Keenan brook, below small tributary, public supply	8/ 5/20													550	+	+	+	
Glens Falls	Keenan distributing reservoirs	8/ 5/20													2,600	—	—	—	
Glens Falls	Intake dam at halfway brook supply	8/ 5/20	Trace	0			.006	.032	.003	.100	.40	37.70	36.50	1.25	1,200	+	—	—	
Goshen	Well at Murray Bros. property, proposed well supply for high school	8/14/20									14.00				394,000	+	+	—	
Goshen	Deep well, E. B. Honfold Bottling Works, proposed well supply for high school	8/14/20									21.50				40	—	—	—	
Goshen	Well at Dr. Thompson's residence, proposed well supply for high school	8/14/20									3.00				6,000	—	—	—	
Goshen	Well at Robbin's property, proposed well supply for high school	8/14/20									15.00				26,500	+	+	+	
Goshen	Tap, public supply	8/14/20													3,200	+	—	—	
Gouverneur	Tap, public supply	2/ 3/20													60	+	+	—	
Gouverneur	Tap in McQuade House, no chlorine added, March 18, public supply	3/23/20													22,000	—	—	—	
Gouverneur	Tap in McQuade House, chlorine added, public supply	3/23/20													200	—	—	—	
Gouverneur	Tap in water office, public supply	3/23/20													200	—	—	—	
Gouverneur	Tap in McQuade House, March 19, public supply	3/23/20													200	—	—	—	
Gouverneur	Raw Oswegatchie river water, public supply	5/13/20													2,000	+	+	+	
Gouverneur	Tap at pumping station, chlorinated water, public supply	5/13/20													13,000	—	—	—	
Gouverneur	Tap at Dr. Sayer's office, public supply	5/13/20													100	—	—	—	
Gouverneur	Raw Oswegatchie river water, public supply	11/16/20													3,100	+	+	+	
Gouverneur	Tap at Dr. Sayer's office, public supply	11/16/20													400	+	—	—	
Green Island	Raw water, public supply	1/29/20	30	Trace			4.464	.108	.010	.200	28.00	151.70	142.00	4.30	30	+	+	—	
Green Island	Tap at pumping station, filtered and chlorinated, public supply	1/29/20	15	Trace			5.04	.094	.050	.300	29.00	151.70	142.00	3.40	20	—	—	—	
Green Island	Tap at Dr. Silcock's office, public supply	1/29/20													10	—	—	—	
Green Island	Well supplemented with river water, public supply	2/ 3/20													5,800	+	+	+	
Green Island	Raw water, chlorinated only, public supply	2/ 3/20													2,400	+	+	+	
Green Island	Tap at pumping station, chlorinated and filtered water, public supply	2/ 3/20													2	—	—	—	
Green Island	Tap at Dr. Silcock's office, public supply	2/ 3/20													2	—	—	—	
Greenport	Well at plant, public supply	5/19/20	Trace	20			.076	.018	.010	.300	108.00	65.70	10.00	1.80	550	—	—	—	

ANALYTICAL RESULTS OF SAMPLES OF WATER — (Continued)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	NITROGEN AS — Free ammonia	NITROGEN AS — Albuminoid ammonia	NITROGEN AS — Nitrites	NITROGEN AS — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. COLI TYPE (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Greenport	Tap, public supply	5/19/20	....	....	....	....	....	....	....	....	....	....	....	....	0	—	—	—	...
Greenport	Fountain in village	6/10/20	....	....	....	....	....	....	....	....	....	....	....	....	26	—	—	—	...
Greenport	New well at electric pump, public supply	6/11/20	0	40	....	....	.096	.016	.003	.300	210.00	76.50	6.00	1.40	12	—	—	—	...
Greenport	Old dug well at pumping station, public supply	6/12/20	0	0	....	....	.004	.008	.001	2.00	120.00	100.00	6.00	.40	23	—	—	—	...
Guilford	Tap, public supply	2/10/20	....	....	....	....	....	....	....	....	....	....	....	....	10	—	—	—	...
Guilford	Tap at Dr. Evans' residence, public supply	2/10/20	....	....	....	....	....	....	....	....	....	....	....	....	10	—	—	—	...
Hammondsport	New well, public supply	1/30/20	....	....	....	....	....	....	....	....	....	....	....	....	5	—	—	—	...
Hammondsport	Tap at R. R. station, public supply	1/30/20	....	....	....	....	....	....	....	....	....	....	....	....	350	—	—	—	...
Hammondsport	Well at Electric Light Co., proposed public supply	3/ 2/20	....	....	....	....	....	....	....	....	....	....	....	....	10	—	—	—	...
Hammondsport	Well at Electric Light Co., proposed public supply	3/30/20	0	10	....	....	.016	.012	.001	.040	2.60	122.80	99.00	1.50	....	...	...	...	...
Hammondsport	Well at Electric Light Co., public supply	5/10/20	....	....	....	....	....	....	....	....	....	....	....	....	25,500	—	—	—	...
Hammondsport	Tap at Electric Light Co., public supply	5/10/20	....	....	....	....	....	....	....	....	....	....	....	....	3,400	—	—	—	...
Hancock	Bear Brook reservoir, public supply	5/26/20	5	5	....	....	.024	.060	Trace	.060	.40	14.30	9.00	1.30	1,800	+	+	—	...
Hancock	Dewitt reservoir, public supply	5/26/20	Trace	2	....	....	.052	.084	.000	.020	.40	14.30	9.00	1.80	130	+	—	—	...
Haverstraw	Cedar Pond Brook, public supply	9/ 3/20	....	....	....	....	....	....	....	1.20	3.00	....	....	....	370,000	+	+	—	...
Haverstraw	Inlet to main Thiell's reservoir, public supply	9/ 3/20	Trace	5	....	....	.002	.034	.002	.160	2.40	61.40	61.00	1.30	74,000	+	+	+	...
Haverstraw	Outlet of upper Thiell's reservoir, public supply	9/ 3/20	....	....	....	....	....	....	....	.20	5.00	....	....	....	200	+	+	+	...
Haverstraw	Tap at pumping station, public supply	9/ 3/20	10	0	....	....	.002	.026	Trace	.300	2.40	36.40	27.00	2.20	11,000	+	+	—	...
Haverstraw	Tap at drug store, Stony Point, public supply	9/ 3/20	....	....	....	....	....	....	....	.20	3.00	....	....	....	1,100	+	+	+	...
Haverstraw	Tap at U. S. Hotel, public supply	9/ 3/20	....	....	....	....	....	....	....	1.20	3.00	....	....	....	1,900	+	—	—	...
Hempstead	Tap at pumping station, public supply	6/15/20	0	0	....	....	.006	.004	.001	1.40	15.00	26.00	7.00	.30	256	—	—	—	...
Hempstead	Tap at drug store, public supply	6/16/20	....	....	....	....	....	....	....	....	....	....	....	....	117	—	—	—	...
Herkimer	Raw water from new intake well at old pumping station, public supply	11/26/20	....	....	....	....	....	....	....	....	....	....	....	....	3,200	—	—	—	...

Herkimer	Chlorinated water from new intake well at old pumping station, public supply	11/26/20	5	Trace			.002	.014	.001	.100	2.50	117.20	116.00	6.80	2	—	—	—	
Herkimer	Raw water at Harter street, pumping station, public supply	11/26/20													3	—	—	—	
Herkimer	Chlorinated water at Harter street pumping station, public supply	11/26/20	0	0			.002	.002	.002	.500	1.50	335.50	265.00	.90	1	—	—	—	
Herkimer	Tap at City Hall, public supply	11/26/20													3	—	—	—	
Herkimer	Raw water from infiltration gallery, public supply	12/ 4/20													1,900	—	—	—	
Herkimer	Chlorinated water, estimated dose chlorine 0.65 P. P. M., public supply	12/ 4/20													4	—	—	—	
Herkimer	Chlorinated water, estimated dose chlorine 0.25 P. P. M., public supply	12/ 4/20													34	—	—	—	
Herkimer	Chlorinated water, estimated dose chlorine 0.58, public supply	12/ 4/20													1	—	—	—	
Herkimer	Chlorinated water, estimated dose chlorine 0.35 P. P. M., public supp.	12/ 4/20													1	—	—	—	
Herkimer	Chlorinated water, estimated dose chlorine 0.40 P. P. M., public supply	12/ 4/20													1	—	—	—	
Herkimer	Chlorinated water, estimated dose chlorine 0.50 P. P. M., public supply	12/ 4/20													3	—	—	—	
Herkimer	Tap at Palmer House estimated dose chlorine 0.60 P. P. M., public supply	12/ 4/20													18	—	—	—	
Hicksville	Tap at pumping station, public supply	5/29/20	0	0			.002	.042	.001	10.00	27.00	58.60	8.00	.30	1	—	—	—	
Hicksville	Tap at L. I. R. R. pumping station, public supply	5/29/20	0	0			.002	.020	.002	.600	6.00	14.30	8.00	.50	42	—	—	—	
Hicksville	Tap in village, public supply	5/29/20													18	—	—	—	
Hilburn	Supply brook above reservoir, public supply	7/ 2/20	140	2			.006	.140	.003	.080	2.00	11.10	8.00	12.30	4,250	+	—	—	
Hilburn	Water taken from top of reservoir, public supply	7/ 2/20													1,550	—	—	—	
Hilburn	Well water taken during pumping at pumping station, public supply	7/ 2/20													5,500	+	+	+	
Hillview	Tap, public supply	6/ 4/20	5	Trace			.004	.072	.001	.080	2.20	215.00	188.00	1.90	1,800	+	—	—	
Hinsdale	Tap, public supply	8/23/20									3.00				71,000	+	+	+	
Hinsdale	Tap, public supply	10/ 5/20	Trace	Trace			.002	.008	.002	.440	2.50	85.80	69.50	1.00	105,000	+	+	—	
Holley	Tap, public supply	8/14/20													144,000	+	—	—	
Holley	Downes well, public supply	10/ 2/20									5.00				1,200	+	+	—	
Holley	North Salisbury well, public supply	10/ 2/20	Trace	0			.002	.010	.005	.500	5.30	486.00	205.00	1.70		+	+	+	
Holley	South Salisbury well, public supply	10/ 2/20	15	Trace			.008	.052	.008	.100	6.40	496.00	213.00	2.85	850	+	+	—	
Holley	Tap at pumping station, Glidden wells, public supply	10/ 2/20	0	Trace			.002	.010	.003	.200	2.80	471.00	180.00	.65	3,000	+	—	—	
Holley	Clarendon well, public supply	10/ 2/20									7.00				7,200	+	+	+	
Holtsville (Suffolk Co., Tuberculosis Sanatorium)	Tap at cellar near storage tank	12/31/20													5	—	—	—	
Holtsville (Suffolk Co. Tuberculosis Sanatorium)	Tap at kitchen	12/31/20													5	—	—	—	

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Continued*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Holtsville (Suffolk Co. Tuberculosis Sanatorium)	Tap at bath in Administration building	12/31/20	...	...	...	...	...	...	...	...	...	...	...	...	5	—	—	—	...
Holtsville (Suffolk Co. Tuberculosis Sanatorium)	Well	12/31/20	0	0	...	...	.002	.002	.000	Trace	4.70	16.20	11.50	.70	...	...	...	...	...
Homer	Tap at pumping station, public supply	12/13/20	0	0	...	...	.002	.002	.000	1.00	1.60	140.00	138.00	.20	5	—	—	—	...
Horseheads	Brook passing pumping station, public supply	5/27/20	...	...	...	...	...	...	...	...	...	...	...	...	4,700	+	—	—	...
Horseheads	Overflow at pumping station, public supply	5/27/20	...	...	...	...	...	...	...	...	...	...	...	...	3,700	—	—	—	...
Horseheads	Tap, public supply	5/27/20	0	0	...	...	.002	.024	.001	1.00	2.60	171.10	125.00	.50	3,900	—	—	—	...
Horseheads	Pump discharge at pumping station, public supply	5/27/20	...	...	...	...	...	...	...	...	...	...	...	...	48,000	—	—	—	...
Hudson	Raw water, public supply	5/26/20	15	Trace	...	...	.008	.146	.001	.060	.40	27.30	20.00	2.90	130	+	—	—	...
Hudson	Clear water well, filtered and chlorinated water, public supply	5/26/20	...	...	...	...	...	...	...	...	...	...	...	...	2	—	—	—	...
Hudson	Tap, filtered and chlorinated water, public supply	5/26/20	5	Trace	...	...	.006	.090	Trace	.060	.60	33.80	24.00	2.80	10	—	—	—	...
Hudson	Raw water, public supply	11/17/20	7	0	...	...	.002	.064	.002	.100	1.80	40.30	35.50	4.10	16,000	+	—	—	...
Hudson	Water having passed through a Pasteur filter	11/17/20	5	0	...	...	.002	.052	.001	.100	1.80	40.30	31.00	3.60	10	—	—	—	...
Huntington	Tap on pump line, public supply	6/24/20	0	0	...	...	.004	.008	.001	2.00	11.00	36.40	23.00	1.00	42	+	+	+	...
Huntington	Tap at railroad station, public supply	6/24/20	...	...	...	...	...	...	...	...	...	...	...	...	270	+	—	—	...
Industry (State Agricultural School)	Tap at refrigeration plant	3/30/20	...	...	...	...	...	...	...	...	...	...	...	...	10,000	+	—	—	...
Iona Island (Doodletown U. S. Navy Ammunitions Depot)	Main stream Doodletown creek, proposed supply for depot	4/21/20	5.00	0	...	...	.012	.038	.000	Trace	2.00	6.90	9.00	1.70	45	+	—	—	...
Iona Island (Doodletown U. S. Navy Ammunitions Depot)	Northwest branch Doodletown creek	4/21/20	5.00	0	...	...	.004	.026	.000	Trace	1.80	16.90	9.00	1.30	30	+	—	—	...
Iona Island (Doodletown U. S. Navy Ammunitions Depot)	Southwest branch Doodletown creek	4/21/20	5.00	0	...	...	.006	.034	.000	Trace	2.00	19.50	8.00	.90	45	—	—	—	...
Iona Island (Doodletown U. S. Navy Ammunitions Depot)	Northwest branch, farther up Doodletown creek	4/21/20	5.00	Trace	...	...	.001	.038	.000	Trace	2.00	16.90	9.00	1.00	7[illegible]	+	—	—	...

Iroquois (Thomas Indian School)	Old well	7/ 7/20	...	...	...	...	...	...	...	...	...	...	...	...	800	—	—	—	...
Iroquois (Thomas Indian School)	New well	7/ 7/20	5.00	Trace	...	...	.002	.002	Trace	.060	.80	182.00	181.00	.10	3,700	—	—	—	...
Iroquois (Thomas Indian School)	Tap at spring	7/ 7/20	5.00	10.00	...	...	.002	.106	Trace	.060	32.00	110.50	...	.70	550	—	—	—	...
Iroquois (Thomas Indian School)	Tap at school	7/ 7/20	...	...	...	...	...	...	...	...	...	...	...	...	30	—	—	—	...
Irvington	Impounding reservoir, public supply	12/10/20	...	...	...	...	...	...	...	...	...	...	...	...	100	+	+	—	...
Irvington	Tap, public supply	12/10/20	5.00	0	...	...	.004	.088	.003	.060	3.20	29.90	29.00	2.50	40	+	—	—	...
Jamaica	Tap at No. 1 pumping station, public supply	5/17/20	0	Trace	...	...	.094	.002	.015	10.60	35.00	94.30	51.00	.90	550	—	—	—	...
Jamaica	Tap at No. 2 pumping station, public supply	6/29/20	0	5.00	...	...	.008	.032	.002	3.00	19.00	48.60	32.00	.10	200	—	—	—	...
Jamestown	Tap at Buffalo pumping station, public supply	12/22/20	...	...	...	...	...	...	...	...	...	...	...	...	119,000	—	—	—	...
Jamestown	Tap at Erie R. R. yards, public supply	12/22/20	...	...	...	...	...	...	...	...	...	...	...	...	600	—	—	—	...
Jamestown	Tap, public supply	12/23/20	0	0	...	...	.002	.004	.003	.060	2.70	91.40	85.00	.10	90	—	—	—	...
Jeffersonville	Callicoon creek, auxiliary public supply	6/19/20	20.00	3.00	...	...	.050	.128	.002	.120	.60	23.40	14.00	3.40	1,300	+	+	—	...
Jeffersonville	Tap, Liekel supply, public supply	6/19/20	15.00	5.00	...	...	.010	.096	.002	.140	.40	28.60	24.00	3.00	25,500	+	+	—	...
Kings Park (State Hospital)	Pump from which water is pumped	7/19/20	...	...	...	...	...	...	...	...	...	...	...	...	6,300	—	—	—	...
Kings Park (State Hospital)	Tap in dining hall	7/19/20	5.00	0	...	...	.004	.012	Trace	.200	5.00	12.70	11.00	1.20	830	—	—	—	...
Lackawanna	Tap at City Hall (Western New York Water Co.), public supply	12/13/20	...	...	...	...	...	...	...	...	...	...	...	...	450	—	—	—	...
Lancaster	Tap (Western New York Water Co.), public supply	12/13/20	Trace	20.00	...	...	.014	.054	.010	.140	11.50	108.60	93.00	2.70	2,300	+	+	—	...
Lancaster	Tap, public supply	12/22/20	...	...	...	...	...	...	...	...	...	...	...	...	3,000	—	—	—	...
Lake Placid	Tap No. 1, public supply	5/19/20	...	...	...	...	...	...	...	...	...	...	...	...	2,800	—	—	—	...
Lake Placid	Tap No. 2, public supply	5/19/20	...	...	...	...	...	...	...	...	...	...	...	...	2,600	—	—	—	...
Lake Placid	Tap, public supply	7/ 7/20	...	...	...	...	...	...	...	...	...	...	...	...	1,700	—	—	—	...
LeRoy	Raw water, public supply	12/17/20	0	0	...	...	.012	.176	.002	.200	10.00	82.90	34.00	3.40	...	...	...	...	...
LeRoy	Water filtered and treated with alum No. 2, public supply	12/22/20	...	...	...	...	...	...	...	...	...	...	...	...	500	—	—	—	...
LeRoy	Water filtered and treated with alum No. 3, public supply	12/22/20	...	...	...	...	...	...	...	...	...	...	...	...	7,700	—	—	—	...
LeRoy	Water filtered and treated with alum No. 4, public supply	12/22/20	...	...	...	...	...	...	...	...	...	...	...	...	500	—	—	—	...
LeRoy	Treated water No. 1, public supply	12/28/20	0	0	...	...	.036	.116	Trace	.140	12.00	116.50	82.00	3.50	225	—	—	—	...
LeRoy	Treated water No. 2, public supply	12/28/20	...	...	...	...	...	...	...	...	...	...	...	...	200	—	—	—	...
Liberty	Tap, public supply	11/ 1/20	20.00	2.00	...	...	.002	.106	.008	.060	1.40	14.30	9.00	4.90	180	+	+	—	...
Little Falls	Aerating canal, public supply	12/17/20	...	...	...	...	...	...	...	...	...	...	...	...	27,500	+	+	—	...
Little Falls	Distributing reservoir, public supply	12/17/20	...	...	...	...	...	...	...	...	...	...	...	...	2,300	—	—	—	...
Livingston Manor	Overflow from reservoir, public supply	11/ 1/20	...	...	...	...	...	...	...	...	...	...	...	...	4,300	+	+	+	...
Livingston Manor	Tap, public supply	11/ 1/20	30.00	Trace	...	...	.002	.112	.015	.060	1.20	14.30	8.00	7.80	12,000	+	+	—	...
Lockport	Tap at pumping station, chlorinated water, public supply	3/22/20	...	...	...	...	...	...	...	...	...	...	...	...	2	—	—	—	...

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Continued*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (− = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Lockport	Niagara river, 400 feet from intake pier, 12 feet below surface, public supply	6/10/20	....	....	....	....	....	....	....	....	....	....	....	....	120	+	+	−	...
Lockport	Niagara river, 75 feet outside main pier on inside channel, 13 feet below surface, public supply	6/10/20	....	....	....	....	....	....	....	....	....	....	....	....	31,500	+	+	+	...
Lockport	Niagara river, 100 feet outside Little Island, 18 feet below surface, public supply	6/10/20	....	....	....	....	....	....	....	....	....	....	....	....	16,000	+	+	+	...
Lockport	Niagara river, 50 feet inside of island, inside channel, 15 feet below surface, public supply	6/10/20	....	....	....	....	....	....	....	....	....	....	....	....	22,000	+	+	+	...
Lockport	Tap at pumping station, chlorinated water, public supply	6/10/20	....	....	....	....	....	....	....	....	....	....	....	....	3	−	−	−	...
Lockport	Niagara river, 900 feet from intake well, 13 feet below surface, public supply	6/11/20	....	....	....	....	....	....	....	....	....	....	....	....	19,500	−	−	−	...
Lockport	Niagara river, 400 feet from intake pier, 12 feet below surface, public supply	6/11/20	....	....	....	....	....	....	....	....	....	....	....	....	120	+	+	−	...
Lockport	Niagara river at intake pier, public supply	6/11/20	....	....	....	....	....	....	....	....	....	....	....	....	350,000	+	−	−	...
Long Beach	Stand pipe at electric station, public supply	5/20/20	0	Trace	....	....	.036	.002	.001	2.40	6.00	38.00	4.00	.60	13	−	−	−	...
Long Beach	Tap at pumping station No. 1, public supply	5/21/20	0	Trace	....	....	.076	.002	.001	2.00	14.00	38.00	9.00	.60	4	−	−	−	...
Long Beach	Well at 23 New York ave.	8/16/20	0	5	....	....	.008	.002	.007	2.00	13.50	32.50	9.50	.30	475	−	−	−	...
Long Beach	Tap at Nassau Hotel, public supply	8/16/20	0	Trace	....	....	.020	.004	.005	2.00	15.00	37.70	3.50	.60	5	−	−	−	...
Long Beach	Well at 23 New York ave.	8/20/20	....	....	....	....	....	....	....	....	....	....	....	....	500	−	−	−	...
Long Beach	Tap at Nassau Hotel, public supply	8/20/20	....	....	....	....	....	....	....	....	....	....	....	....	2,200	−	−	−	...
Long Eddy	Intake reservoir, public supply	5/25/20	....	....	....	....	....	....	....	....	....	....	....	....	86,000	+	+	−	...
Long Eddy	Tap, public supply	5/25/20	5	Trace	....	....	.004	.070	.001	.140	.80	23.40	13.00	.50	190,000	−	−	−	...
Lynbrook	Water from stand pipe at power house, public supply	1/10/20	0	Trace	....	....	.032	.052	Trace	1.50	35.00	41.60	11.00	.30	1	−	−	−	...

Lynnbrook	Tap at Miss Miner's residence, public supply	1/12/20													5	—	—	—	
Lynnbrook	Tap at pumping station, public supply	1/12/20								2.50	16.00					—	—	—	
Lyons	Tap at pumping station, filtered water, public supply	9/27/20	5	Trace			.002	.110	Trace	.080	3.20	180.00	97.50	3.85	50	—	—	—	
Lyons	Tap at Johnson Cherry's residence	9/27/20													50	—	—	—	
Lyons	Tap at Dr. Simpson's office	9/27/20													200	—	—	—	
Madison	Spring basin	12/10/20									5.00				15	—	—	—	
Madison	Tap, public supply	12/10/20	0	0			.002	.008	Trace	2.00	.40	221.50	212.00	.30	5	—	—	—	
Manhasset	Wells 1 and 2 at pump station, public supply	6/16/20													113	—	—	—	
Manhasset	Wells 2 and 3 at pump station, public supply	6/16/20													8,300	—	—	—	
Manhasset	Combined wells, Enginman house, public supply	6/15/20	0	0			.002	.004	.001	.300	15.00	31.20	30.00	.60	5,300	—	—	—	
Manchester	Well, public supply	12/10/20													50	—	—	—	
Manchester	Faucet, public supply	12/10/20	Trace	20			.016	.022	.007	.140	75.00	428.50	221.00	2.10	0	—	—	—	
Manlius	Main spring, public supply	8/18/20													400	+	—	—	
Manlius	Reservoir, public supply	8/18/20													575	+	+	+	
Manlius	Tap at railroad station, public supply	8/18/20													2,100	+	+	—	
Maple Hill	Tap at pump ng station, public supply	5/13/20													34	+	—	—	
Maspeth	Tap at pumping station, Urban Water Co., public supply	5/13/20													102	+	—	—	
Massena	Tap at filter house after chlorination, public supply	2/ 5/20													1	—	—	—	
Mechanicville	Baker brook at filter plant, public supply	4/14/20													7,400		+	—	—
Mechanicville	Raw water inlet channel to filters, public supply	4/14/20													2,100	+	+	+	
Mechanicville	Overflow of reservoir, public supply	4/14/20													14,500	+	+	+	
Mechanicville	Tap at pump discharge, filtered water, public supply	4/14/20													60	—	—	—	
Mechanicville	Tap at municipal building, public supply	4/14/20	35	80			.014	.108	.005	.060	1.60	54.30	42.00	5.90	2,500	+	+	—	
Mechanicville	Dean Spring, public supply	4/20/20									13.00				5	—	—	—	
Mechanicville	Moore Spring, public supply	4/20/20									16.00				3	—	—	—	
Mechanicville	Raw water from pond, public supply	9/28/20													1,600	+	+	—	
Mechanicville	Filtered water, public supply	9/28/20													60	—	—	—	
Mechanicville	Tap at Dr. Van Doran's office, public supply	9/28/20													80	+	—	—	
Mechanicville	Strang well	9/28/20									17.00				45	—	—	—	
Mechanicville	Norman's well	9/28/20									19.00				60	+	+	+	
Medina	Tap, public supply	10/27/20	0	0			.002	.026	Trace	.400	16.50	328.50	162.50	1.40	550	—	—	—	
Merrick	Tap at Birch store, public supply	5/20/20													7	—	—	—	
Merrick	Pump house, public supply	5/20/20	0	0			.208	.036	.000	1.60	12.00	20.80	12.00	.60					
Menands	Tap, public supply	7/ 2/20													26	+	—	—	
Middleport	Proposed source of public supply	2/26/20													1,700	+	+	—	
Middleport	Proposed source of public supply	3/ 9/20	15	10			.040	.128	.003	1.20	9.20	194.20	180.00	6.20					
Middleport	Springs, public supply	11/27/20													5,500	+	+	—	

ANALYTICAL RESULTS OF SAMPLES OF WATER — (Continued)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Albuminoid ammonia	Nitrites	Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Middleport	Tap at Fire Building, public supply	11/27/20													25	+	—	—	...
Middleport	Tap at High School Building, public supply	11/27/20													550	+	—	—	...
Middleport	Tap at American Hotel, public supply	11/27/20													6,000	+	+	—	...
Middletown (State Hospital)	Tap, Highland supply, public supply	1/31/20	5	Trace			.116	.134	.001	.160	1.40	36.40	9.00	3.50	110	—	—	—	...
Middletown	Tap, Monhagen supply, public supply	1/31/20													20	—	—	—	...
Middletown	Raw water, Monhagen supply, public supply	10/30/20	10	2			.074	.208	.015	.100	1.20	27.30	21.50	5.50	250	—	—	—	...
Middletown	Filtered water, Monhagen supply, public supply	10/30/20	10	Trace			.016	.144	.008	.200	1.20	26.00	21.50	5.40	500	+	—	—	...
Middletown	Raw water, Highland supply, public supply	10/30/20													1,000	—	—	—	...
Middletown	Filtered water, Highland supply, public supply	10/30/20	2	0			.010	.066	.001	.300	1.60	23.40	14.00	2.30	2,700	—	—	—	...
Middleville	Reservoir, public supply	10/23/20													40	+	—	—	...
Middleville	Tap, public supply	10/23/20	10	Trace			.004	.060	.003	.100	1.30	100.00	95.00	2.60	475	+	+	—	...
Millerton	Well supply public supply	6/1/20	0	0			.002	.024	.001	.200	1.40	100.00	88.00	.70	275	—	—	—	...
Millerton	Spring supply, pubic supply	6/1/20	0	0			.002	.010	.001	.140	1.00	134.20	111.00	.30	8,800	—	—	—	...
Millerton	Tap, public supply	6/1/20													44,000	—	—	—	...
Mineola	Driven well at pumping station, public supply	6/10/20	0	0			.004	.004	.005	7	17.00	54.30	8.00	.60	25,000	—	—	—	...
Mineola	Tap, public supply	6/10/20													98	—	—	—	...
Monticello	Water from intake pipe, public supply	5/25/20	5	Trace			.006	.008	.001	.020	2.20	9.50	6.00	1.20					...
Monticello	Tap in lower hall, Dr. Cauther's office, public supply	5/25/20													450	—	—	—	...
Monticello	Tap in Crane's pharmacy, public supply	5/25/20													50	—	—	—	...
Monticello	Tap at Dr. Cauther's office, public supply	5/25/20													100	—	—	—	...
Moravia	Tap, public supply	12/22/20	0	0			.002	.028	Trace	1.60	1.20	44.30	41.00	.60	150	—	—	—	...
Morrisville (State Agricultural School)	Spring	6/22/20	0	Trace			.002	.002	.001	.400	.80	175.50	175.00	.50	29,000	+	—	—	...

Morrisville (State Agricultural School)	Tap	6/22/20	0	Trace	....	....	.002	.010	.001	.400	1.40	182.80	182.00	.60	45,500	+	+	−	...
Morrisville (State Agricultural School)	Tap	7/22/20	10	10	....	....	.010	.132	.003	.100	.20	37.70	37.00	2.10	2,000	+	+	+	...
Mt. Morris	Raw water at filter plant, public supply	12/15/20	5	0	....	....	.006	.118	Trace	.200	3.80	85.80	77.00	3.40	8,500	−	−	−	...
Mt. Morris	Filtered and chlorinated water, public supply	12/15/20	0	0	....	....	.002	.138	Trace	.200	4.00	88.60	79.00	2.70	1,000	−	−	−	...
Mt. Morris	Filtered and chlorinated water, public supply	12/15/20	....	....	....	....	....	....	....	....	....	....	....	....	5,200	−	−	−	...
Mt. Pleasant School (Brace Farm)	Spring 9 ft. back of storage, property Children's Aid Society	5/10/20	....	....	....	....	....	....	....	....	....	....	....	....	146	−	−	−	...
Mt. Pleasant School (Brace Farm)	Spring 100 ft. from residence, property Children's Aid Society	5/10/20	....	....	....	....	....	....	....	....	....	....	....	....	74	−	−	−	...
Mt. Pleasant School (Brace Farm)	Storage reservoir, property of Children's Aid Society	5/10/20	....	....	....	....	....	....	....	....	....	....	....	....	600	−	−	−	...
Mt. Pleasant School (Brace Farm)	Tap in house, property of Children's Aid Society	5/10/20	....	....	....	....	....	....	....	....	....	....	....	....	500	+	−	−	...
Mt. Pleasant School (Brace Farm)	Tap on grounds, property of Children's Aid Society	5/10/20	....	....	....	....	....	....	....	....	....	....	....	....	600	+	−	−	...
Mt. Vernon	Raw Hutchinson river water, public supply	4/11/20	....	....	....	....	....	....	....	....	....	....	....	....	800	+	+	−	...
Mt. Vernon	Raw water at Pelham filters, Mahlstead reservoir, public supply	4/11/20	....	....	....	....	....	....	....	....	....	....	....	....	2,600	+	+	+	...
Mt. Vernon	Filtered and chlorinated water from Pelham Plant, public supply	4/11/20	....	....	....	....	....	....	....	....	....	....	....	....	2	−	−	−	...
Mt. Vernon	Raw water, Mamaroneck reservoir, public supply	4/11/20	....	....	....	....	....	....	....	....	....	....	....	....	350	+	+	+	...
Mt. Vernon	Filtered and chlorinated water, Mamaroneck supply, public supply	4/11/20	....	....	....	....	....	....	....	....	....	....	....	....	20	−	−	−	...
Napanoch (State Reformatory)	Tap	7/ 8/20	0	0	....	....	.004	.022	Trace	.020	1.20	11.10	6.00	1.60	4,700	−	−	−	...
Newark (State School)	Tap on pump, raw barge canal water, public supply	1/17/20	15	Trace	....	....	.122	.132	.003	.700	25.00	307.00	165.00	4.60	18,000	+	+	+	...
Newark (State School)	Tap in boiler feed pump room, filtered water	1/17/20	10	Trace	....	....	.004	.110	.001	.500	25.00	285.50	156.00	3.40	80	+	+	−	...
Newark (State School)	Tap in girls' dining room, main building	1/17/20	0	0	....	....	.002	.016	.000	.300	3.20	314.00	192.00	.50	10	−	−	−	...
Newark	Raw water at filter plant, public supply	12/13/20	20	20	....	....	.008	.226	.015	2.40	3.20	160.00	131.00	7.80	1,000	+	+	+	...
Newark	Filtered water at filter plant, public supply	12/13/20	20	15	....	....	.012	.246	.010	1.60	3.20	162.80	136.00	6.70	750	+	+	−	...
Newark	Tap at American Express office, public supply	12/13/20	....	....	....	....	....	....	....	....	....	....	....	....	650	+	−	−	...
New Berlin	Raw water at C. E. Atherton's residence, public supply	11/27/20	Trace	Trace	....	....	.002	.020	.002	.200	1.60	97.20	95.00	2.10	1,000	+	+	−	...
New Berlin	Main, large reservoir, public supply	11/27/20	....	....	....	....	....	....	....	....	....	....	....	....	110	+	+	+	...

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Continued*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
New Berlin	Sterilized water at H. Hull's residence, public supply	11/27/20	Trace	0	...	...	.002	.026	.002	.300	1.60	97.20	95.00	2.00	5,700	+	+	—	...
New Paltz	Tap, public supply	12/28/20	0	0	...	...	.002	.016	Trace	.160	1.80	51.40	48.00	1.00	140	—	—	—	...
New York City (House of Refuge, Randall's Island)	Tap in boys' kitchen	11/15/20	10	Trace	...	...	.002	.058	.006	1.00	3.00	44.30	31.00	4.20	...	...	...	...	...
New York City (Ward's Island)	Tap at store	12/13/20	5	0	...	...	.002	.132	.000	.160	2.00	38.00	36.00	2.80	...	...	...	...	...
Niagara Falls	Raw water, municipal supply	3/22/20	...	...	...	...	...	...	...	...	...	...	...	...	78,000	+	+	—	...
Niagara Falls	Filtered water, municipal supply	3/22/20	...	...	...	...	...	...	...	...	...	...	...	...	16,500	—	—	—	...
Niagara Falls	Filtered and chlorinated water, public supply	3/22/20	...	...	...	...	...	...	...	...	...	...	...	...	1	—	—	—	...
Niagara Falls	Tap at Imperial Hotel, municipal supply	3/22/20	...	...	...	...	...	...	...	...	...	...	...	...	1	—	—	—	...
Niagara Falls	Raw water, Western New York Water Co., public supply	3/22/20	...	...	...	...	...	...	...	...	...	...	...	...	190,000	+	+	+	...
Niagara Falls	Filtered water, preliminary chlorination, public supply	3/22/20	...	...	...	...	...	...	...	...	...	...	...	...	1,300,000	+	+	—	...
Niagara Falls	Tap at pumping station, filtered and chlorinated water, subsequent chlorination, public supply	3/22/20	...	...	...	...	...	...	...	...	...	...	...	...	15	—	—	—	...
Niagara Falls	Tap at corner Falls and 1st sts., Western New York Water Co., public supply	3/22/20	...	...	...	...	...	...	...	...	...	...	...	...	1	—	—	—	...
Northport	Tap, public supply	5/22/20	...	...	...	...	...	...	...	...	...	...	...	...	70	—	—	—	...
Northport	Tap at pumping station, public supply	6/22/20	0	0	...	...	.006	.014	.000	.400	9.00	16.90	16.00	.30	228	—	—	—	...
North Tarrytown	Raw Pocantico Lake water, public supply	9/ 2/20	50.00	10.00	...	...	.042	.184	.003	.020	4.40	52.90	46.00	6.10	22,000	+	+	+	...
North Tarrytown	Coagulated water, public supply	9/ 2/20	...	...	...	...	...	...	...	...	...	...	...	...	600	+	+	—	...
North Tarrytown	Filtered and chlorinated water, public supply	9/ 2/20	...	...	...	...	...	...	...	...	...	...	...	...	2	—	—	—	...
North Tonawanda	Tap at water works office, public supply	2/ 3/20	...	...	...	...	...	...	...	...	...	...	...	...	1	—	—	—	...
North Tonawanda	Tap, public supply	2/ 3/20	5.00	5.00	...	...	.010	.076	.005	.060	12.00	101.50	85.00	1.50	...	...	...	...	...
North Tonawanda	Tap at Dr. Barnard's office, public supply	2/ 3/20	...	...	...	...	...	...	...	...	...	...	...	...	3	—	—	—	...

North Tonawanda	Tap at pumping station, chlorinated water, public supply	3/22/20													4	−	−	−	
North Tonawanda	Tap at Dr. Barnard's office, public supply	4/ 6/20													550	−	−	−	
North Tonawanda	Niagara river at intake crib, 8 feet below surface, public supply	6/10/20													7,000	+	−	−	
North Tonawanda	Niagara river 600 feet from intake pier, 17 feet below surface	6/10/20													1,300	+	+	+	
North Tonawanda	Niagara river, 300 feet from shore, 15 feet below surface	6/10/20													7,700	+	+	+	
North Tonawanda	Niagara river, 300 feet from intake pier, 18 feet below surface	6/10/20													240	+	+	−	
North Tonawanda	Niagara river, 25 feet off shore, 18 feet below surface	6/10/20													12,000	+	+	+	
North Tonawanda	Raw water, at intake valve house, public supply	6/11/20													650	+	+	−	
North Tonawanda	Tap at pumping station, chlorinated water, public supply	6/11/20													14,000	−	−	−	
North Tonawanda	Chlorinated water at intake well, public supply	10/23/20													4,600	+	+	−	
North Tonawanda	Tap at pumping station, public supply	10/23/20													7,500	−	−	−	
North Tonawanda	Tap at barber shop, chlorinated water, public supply	10/23/20													13,000	−	−	−	
North Tonawanda	Tap at American Express office, chlorinated water, public supply	10/23/20													12,500	+	−	−	
Norwich	Tap, filtered water, public supply	5/ 1/20													275	−	−	−	
Norwich	Chenango Lake, public supply	12/13/20													1,100	−	−	−	
Norwich	Lower reservoir, public supply	12/13/20													350	+	+	−	
Norwich	Raw water, public supply	12/13/20	20.00	3.00			.006	.086	.003	.240	1.20	24.80	21.00	2.50	220,000	+	+	−	
Norwich	Filtered water, public supply	12/13/20		0			.004	.028	.000	.240	1.60	27.30	15.00	.30	1,600	−	−	−	
Nunda	Sager spring, public supply	12/17/20	0	0			.004	.014	.001	1.00	2.80	134.20	134.00	1.30	20,000	−	−	−	
Nunda	Tap, public supply	12/17/20													57,000	+	−	−	
Oakfield	Tap at Homer Bullock's residence, public supply	6/28/20	0	Trace			.018	.054		.400	10.20	814.00	196.00	.80	1,500	−	−	−	
Oakfield	Tap at F. Smith's residence, public supply	6/28/20													175	−	−	−	
Oakfield	Tap at Goushouse's residence, public supply	6/28/20													160	−	−	−	
Ocean Beach	Well supply, public supply	6/ 1/20	5.00	Trace			.110	.060	.010	.100	40.00	67.10	53.00	1.80	43,000	−	−	−	
Ogdensburg (St. Lawrence State Hospital for the Insane)	Softened water	11/23/20	0	20.00			.002	.032	.003	.020	6.30	72.80		1.40	400	−	−	−	
Ogdensburg (St. Lawrence State Hospital for the Insane)	Tap at hospital city water	11/23/20	0	0			.002	.088	.002	.080	7.90	105.80	85.50	1.45	26	−	−	−	
Old Forge	Tap at pond, public supply	8/16/20	110.0	Trace			.002	.152	.005	.200	3.00	29.90	20.00	17.40	800	+	−	−	
Old Forge	Tap, public supply	8/16/20													1,300	−	−	−	
Oneida	Tap at railroad station, south plant public supply	12/ 8/20	0	0			.002	.106	.003	.020	13.00	671.00	168.00	3.30	4,450	+	−	−	
Oneida	Well supply at National Casket Co. south plant, public supply	12/ 8/20													300	+	+	−	

ANALYTICAL RESULTS OF SAMPLES OF WATER — (Continued)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Oneida	Valve house, tap on upper reservoir blow off line, public supply	12/ 8/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,200	—	—	—	...
Oneida	Lower reservoir near overflow, public supply	12/ 8/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,000	+	—	—	...
Oneonta	Raw water, public supply	12/17/20	15.00	30.00	.....	.....	.002	.088	.015	.100	1.00	20.80	20.00	3.80	32,000	+	+	—	...
Oneonta	Tap at filter plant, public supply	12/17/20	0	0	.....	.....	.002	.012	.002	.060	1.20	19.50	19.00	.60	60	—	—	—	...
Ossining (Sing Sing Prison)	Tap in kitchen	12/13/20	10.00	0	.....	.....	.002	.080	0	.700	4.00	58.60	56.00	2.80	550	+	—	—	...
Oswego	Tap at city hall, public supply	8/30/20	2.00	Trace	.....	.....	.002	.060	.001	.140	11.50	102.80	99.00	1.50	.....	...	...	...	...
Oswego	Tap at Best's ice cream parlor, public supply	9/16/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,700	+	+	—	...
Oswego	Tap at Beckstead's residence, public supply	9/16/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,400	+	+	—	...
Oswego	Tap at McCaffrey's residence, public supply	9/16/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	900	+	+	—	...
Oswego	Tap at city hall, public supply	9/16/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,100	—	—	—	...
Oswego	Tap at Best's ice cream parlor, public supply	10/ 9/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	+	—	—	...
Oswego	Tap at Wade's garage, public supply	10/ 9/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35	—	—	—	...
Oswego	Tap at McCaffrey's residence, public supply	10/ 9/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	—	—	—	...
Oswego	Tap at W. McCaffrey's residence, public supply	10/ 9/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	150	+	—	—	...
Otego	Reservoir, public supply	12/17/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50,000	+	+	+	...
Otego	Tap, public supply	12/17/20	5.00	15.00	.....	.....	.002	.060	.015	.600	1.80	26.00	25.00	1.30	2,800	+	+	—	...
Owego	Raw well water, public supply	4/14/20	0	0	.....	.....	.010	.022	.00	1.20	4.00	80.00	75.00	.30	90	—	—	—	...
Owego	Raw reservoir water before treatment with alum, public supply	4/14/20	5.00	15.00	.....	.....	.014	.072	.005	.140	1.60	19.50	11.00	1.70	90	—	—	—	...
Owego	Raw reservoir water after treatment with alum, public supply	4/14/20	5.00	15.00	.....	.....	.012	.068	.003	.100	1.60	22.10	9.00	2.20	.....	...	...	...	...
Owego	Filtered reservoir water, public supply	4/14/20	5.00	5.00	.....	.....	.002	.062	.001	.140	1.40	19.50	7.00	1.20	5	—	—	—	...
Owego	Tap public supply	4/14/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	—	—	—	...

Oxford (Woman's Relief Corps Home)	Railroad tank	3/22/20													13,000	+	+	—
Oxford (Woman's Relief Corps Home)	Well	3/22/20	25	30			.036	.090	.003	.600	2.20	48.60	41.00	4.00	1,600	+	+	+
Oxford (Woman's Relief Corps Home)	Tap in kitchen	3/22/20	0	Trace			.002	.020	.001	Trace	.60	22.10	9.00	1.10	6,200	+	—	—
Oxford (Woman's Relief Corps Home)	Well at farm cottage	3/22/20													1,800	+	—	—
Oxford (Woman's Relief Corps Home)	Artesian well	7/ 7/20	5	40			.004	.024	.001	.100	2.20	72.80		1.20	1	—	—	—
Oxford (Woman's Relief Corps Home)	Tap in kitchen	7/ 7/20													5,600	+	—	—
Oxford (Woman's Relief Corps Home)	Railroad tank	7/ 7/20	0	0			.004	.026	.0[illegible]	.500	1.20	60.00	53.00	.50	59,000	+	+	—
Oxford (Woman's Relief Corps Home)	New spring	7/ 7/20									2.00				25,000	+	—	—
Oxford (Woman's Relief Corps Home)	Railroad tank	7/29/20													28,000	+	+	—
Oxford (Woman's Relief Corps Home)	Well	7/29/20													24,000	+	—	—
Oxford (Woman's Relief Corps Home)	Well	8/ 5/20	5	20			.356	.208	.003	.100	8.50	78.60	75.00	5.10	62,000	+	+	+
Oxford (Woman's Relief Corps Home)	Well	8/19/20	20	30			.022	.072	.005	.500	2.60	160.00	115.00	3.40				
Oxford (Woman's Relief Corps Home)	Tap at D. L. & W. R. R.	11/26/20	0	0			.002	.002	.002	.600	1.00	41.60	35.00	.80	5	—	—	—
Oyster Bay	Office pump, public supply	6/18/20													8,800	+	+	+
Oyster Bay	Tap in village, public supply	6/18/20													15,000	+	+	—
Oyster Bay	Tap at pumping station, public supply	6/23/20	Trace	0			.008	.032	.002	.500	8.00	23.40	15.00	1.00				
Palisades Park	Well at Negro Fresh Air Camp	8/16/20	5	10			.002	.126	.003	.800	5.30	23.40	11.50	.85	100,000	+	+	+
Palisades Park	Gate Hill Spring No. 1	8/16/20	0	0			.002	.002	.001	.020	1.30	11.10	5.00	.10	3,400	+	—	—
Palisades Park	Gate Hill Spring No. 2	8/16/20	Trace	0			.002	.008	.001	Trace	1.90	22.70	5.50	.10	1,700	+	+	—
Palisades Park	Gate Hill Brook No. 4	8/16/20	200	Trace			.006	.332	.005	.060	2.00	15.60	5.00	19.80	7,400	+	+	—
Palisades Park	Queensboro Brook	8/17/20	35	1			.002	.094	.004	.060	1.60	22.10	17.00	2.30	7,500	+	+	—
Palisades Park	Spring at Y. M. C. A. Camp	8/17/20	Trace	0			.002	.008	.001	.020	1.50	58.60	40.00	.85	230	—	—	—
Palisades Park	Spring at employees' cottage	8/17/20	3	2			.014	.030	.002	.060	2.30	26.00	10.50	.10	11,000	+	+	+
Palisades Park	Brook's lake well (F-A)	8/17/20	Trace	0			.002	.008	.002	.060	2.80	50.00	21.50	.30	120	+	+	—
Palisades Park	Brook's lake well (F-B)	8/17/20	0	0			.002	.002	.002	1.20	5.20	65.70	23.50	.45	54,000	+	+	+
Palisades Park	Spring BM-17	8/17/20	Trace	0			.002	.008	.001	.060	1.80	24.70	8.00	.35	9,500	+	+	+
Palisades Park	Stream at reservoir	8/17/20								.04	1.50				1,800	+	+	+
Palisades Park	Spring, main supply at Bear mountain (B-M-A-1)	8/17/20								.12	1.00				26,500	+	+	+
Palisades Park	Spring, main supply at Bear mountain (B-M-A-2)	8/17/20	3	0			.002	.008	.001	.200	2.10	26.60	9.00	.20	600	—	—	—
Palisades Park	Spring, Lake Tioroti (C-2)	8/21/20													9,500	+	—	—
Palisades Park	Spring, Lake Tioroti (C-4)	8/21/20								Trace	4.00				1,000	+	+	—
Palisades Park	Well	8/21/20									3.00				6,400	—	—	—
Palisades Park	Seven Lakes driven spring	8/21/20									4.00				1,300	+	—	—

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Continued*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Palisades Park	Arden Trail spring	8/21/20	...	...	...	...	...	...	...	.08	4.00	...	...	...	600	+	—	—	...
Palisades Park	Drilled well (J-O-21)	8/23/20	...	...	...	...	...	...	...	...	15.00	...	...	...	4,400	—	—	—	...
Palisades Park	Spring (J-O-24)	8/23/20	...	...	...	...	...	...	...	...	3.00	...	...	...	3,400	+	—	—	...
Palisades Park	Spring (K-3)	8/23/20	...	...	...	...	...	...	...	.12	8.00	...	...	...	1,900	+	+	—	...
Palisades Park	Well (K-4)	8/23/20	...	...	...	...	...	...	...	...	11.00	...	...	...	45	—	—	—	...
Palisades Park	Well (K-5)	8/23/20	...	...	...	...	...	...	...	.60	5.00	...	...	...	33,000	+	—	—	...
Palisades Park	Well (K-6)	8/23/20	...	...	...	...	...	...	...	...	...	...	...	...	27,000	—	—	—	...
Palisades Park	Drilled well (K-2)	8/23/20	...	...	...	...	...	...	...	...	74.00	...	...	...	1,400	—	—	—	...
Palisades Park	Drilled well (K-7)	8/23/20	...	...	...	...	...	...	...	...	8.00	...	...	...	1,000	—	—	—	...
Palisades Park	Spring pond at overflow	8/23/20	60	Trace	...	...	.080	.164	.002	.020	1.60	15.60	10.00	9.70	90	+	—	—	...
Palisades Park	Tap from pond (K-1)	8/23/20	...	...	...	...	...	...	...	...	2.50	...	...	...	45	—	—	—	...
Palisades Park	Brook at Lake Kanawauke, Seven Lakes Division	8/23/20	70	0	...	...	.006	.164	.003	.020	1.80	16.90	8.00	12.50	10,000	+	—	—	...
Palisades Park	Spring at Lake Kanawauke	8/23/20	...	...	...	...	...	...	...	.040	5.00	...	...	...	600	+	+	+	...
Palisades Park	Drilled well (K-1)	8/23/20	...	...	...	...	...	...	...	...	13.00	...	...	...	11,000	—	—	—	...
Palisades Park	Lake Cohasset spring	8/27/20	...	...	...	...	...	...	...	.040	23.00	...	...	...	10,300	+	+	—	...
Palisades Park	Spring at S-6	8/27/20	...	...	...	...	...	...	...	.040	2.00	...	...	...	48,500	+	+	+	...
Palisades Park	Tap at S-6, Green Pond supply	8/27/20	200	0	...	...	Trace	.290	.004	.080	2.20	22.10	4.00	28.80	43,000	+	+	—	...
Palisades Park	Green Pond overflow at inlet to reservoir	8/27/20	...	...	...	...	...	...	...	.800	2.00	...	...	...	30,500	+	—	—	...
Palisades Park	Sure Ridge Brook at Lake Cohasset	8/27/20	60	0	...	...	Trace	.136	.002	.020	2.00	20.80	8.00	11.00	56,000	+	+	—	...
Palisades Park	Summit Lake, water near intake	8/27/20	...	...	...	...	...	...	...	.12	2.00	...	...	...	600	+	—	—	...
Palisades Park	Tap at Summit Lake, spring supply	8/27/20	...	...	...	...	...	...	...	...	10.00	...	...	...	20,000	+	—	—	...
Palisades Park	Tap at camp, Summit Lake	8/27/20	30	0	...	...	Trace	.136	.001	.020	1.60	16.90	10.00	3.80	190	+	—	—	...
Palisades Park	Spring No. 2, Summit Lake camp	8/27/20	...	...	...	...	...	...	...	.120	8.00	...	...	...	120,000	+	+	+	...
Palisades Park	Dug well (L-TL No. 4)	8/27/20	...	...	...	...	...	...	...	1.28	29.00	...	...	...	1,900	+	—	—	...
Palisades Park	Main pond supply at L-T-L No. 2	8/28/20	...	...	...	...	...	...	...	...	...	...	...	...	250	—	—	—	...
Palisades Park	Main pond supply, L-T-L No. 8, Twin Lakes	8/28/20	35	0	...	...	Trace	.228	.002	.020	3.80	38.00	36.00	5.50	250	—	—	—	...
Palisades Park	Spring (7-B)	8/28/20	...	...	...	...	...	...	...	.240	6.00	...	...	...	10,000	+	—	—	...
Palisades Park	Dug well (Q-6)	8/28/20	...	...	...	...	...	...	...	4.00	50.50	...	...	...	6,900	—	—	—	...
Palisades Park	Drilled well (K-10)	8/28/20	...	...	...	...	...	...	...	.40	10.00	...	...	...	45,000	—	—	—	...
Palisades Park	Drilled well (K-9)	8/28/20	...	...	...	...	...	...	...	.32	6.00	...	...	...	250	—	—	—	...

Palisades Park	Lake Stohae, Black Shanty Spring	8/28/20								.40	.50				16,000	+	—	—	
Palisades Park	Stillwater Brook (K-8)	8/28/20													72,000	—	—	—	
Palisades Park	Drilled well (K-14)	8/28/20									5.00				7,000	—	—	—	
Palisades Park	Tap of drilled well at Rockland camp	8/30/20									11.50				4,500	—	—	—	
Palisades Park	Tap at mess hall, Spring Valley	8/30/20													11,000	+	—	—	
Palisades Park	Blauvelt drilled well	8/30/20									5.00				40	—	—	—	
Palisades Park	Well at Hock Mountain beach	8/30/20	Trace	Trace			.002	.004	.001	1.40	6.50	90.00	85.00	.15	27,000	+	+	+	
Palisades Park	North spring at Bloomer's beach	9/ 3/20	0	Trace			.002	.002	Trace	.200	8.50	64.30	25.00	.50	22,000	+	+	—	
Palisades Park	South spring at Bloomer's beach	9/ 3/20								.24	9.50				120,000	+	+	+	
Palisades Park	Spring at Hazard's block	9/ 3/20								.60	9.00				40,000	+	+	+	
Palisades Park	Powder House spring	9/ 3/20								1.08	13.00				198,000	+	+	+	
Palisades Park	Englewood spring	9/ 3/20								1.08	9.50				700,000	+	+	+	
Palisades Park	Forest View well	9/ 3/20	5	Trace			.034	.024	.005	1.00	5.00	65.70	24.50	1.30	9,000	+	+	+	
Palisades Park	Forest View, middle spring	9/ 3/20	Trace	Trace			.002	.002	.001	.020	4.70	78.60	46.50	1.40		+	+	—	
Palisades Park	Alpine Beach spring	9/ 3/20	Trace	0			.002	.004	Trace	1.40	6.20	82.90	34.00	1.25	200,000	+	+	—	
Palisades Park	Alpine Beach spring ½ mile above dock	9/ 3/20													17,000	—	—	—	
Palisades Park	Spring at camp opposite Grey's lane	9/ 3/20													200,000	+	—	—	
Palisades Park	Spring at Pell estate	9/ 3/20													260	+	+	+	
Palisades Park	Drilled well at Pell estate	9 /3/20								.04	5.00				350	+	+	+	
Palisades Park	Forest View, north spring	9/ 3/20														+	+	—	
Palmyra	Lower well, public supply	11/ 9/20	Trace	0			.002	.038	.002	2.00	6.40	493.00	186.00	1.85	69,000	—	—	—	
Palmyra	Upper well, public supply	11/ 9/20	Trace	0			.002	.022	.002	2.00	11.00	371.50	214.50	1.25	1,300	—	—	—	
Palmyra	Spring	11/20/20	Trace	0			.002	.030	.001	2.00	2.90	335.50	191.00	1.60	5,000	+	—	—	
Palmyra	Well	11/20/20									1262.				5	—	—	—	
Patchogue	Tap at pumping station, public supply	6/ 1/20	10.00	Trace			.090	.052	.001	.500	8.00	22.10	12.10	.60	92,500	—	—	—	
Peekskill	Raw water, suction well, public supply	8/16/20	60.00	5.00			.030	.266	.004	.100	1.90	32.50	28.00	7.40	1,500	—	—	—	
Peekskill	Sedimentation basin, near outlet, public supply	8/16/20													275	+	+	—	
Peekskill	Water on filter No. 4, after aeration public supply	8/16/20													2,700	+	+	—	
Peekskill	Tap, public supply	8/16/20	20.00	Trace			.002	.066	.003	.200	1.80	38.00	32.50	3.50	99,000	—	—	—	
Penn Yan	Tap, Keuka lake outlet, near Birket mill, public supply	12/13/20	3.00	Trace			.168	.096	Trace	.140	3.80	83.20	81.00	2.80	10,000	+	+	+	
Penn Yan	Tap at Main st., public supply	12/13/20	Trace	Trace			.002	.124	Trace	.100	2.60	91.40	86.00	2.00	11,000	—	—	—	
Penn Yan	Tap at American Express office	12/13/20													2,100	+	—	—	
Perry	Tap at Goodwin's office, public supply	5/25/20	Trace	Trace			.004	.122	.001	.200	3.20	85.70	81.00	2.10	9,900	—	—	—	
Perry	Tap at Perry club, public supply	5/25/20														—	—	—	
Perry	Tap at Baker & Roberts', public supply	5/25/20													16,000	—	—	—	
Perry	Tap at restaurant, public supply	5/25/20														—	—	—	
Perry	Tap at express office, public supply	5/25/20														—	—	—	
Perry	Raw water at pumping station, public supply	12/22/20	0	Trace			.026	.090	.001	.200	3.80	88.60	80.00	2.10	5,500	—	—	—	
Perry	Filtered water at filter plant, public supply	12/22/20													425	—	—	—	
Perry	Tap, public supply	12/22/20													200	—	—	—	
Petersburg	Well supply, public supply	10/11/20									15.50				5	—	—	—	
Petersburg	Tap, public supply	10/11/20	10.00	Trace			.002	.096	.001	.120	1.40	24.70	24.50	3.20	550	+	+	—	

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Continued*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Phoenix	Tap at pump discharge, public supply	7/ 9/20	....	....	....	....	....	....	....	....	....	....	....	....	3,700	+	+	—	...
Phoenix	Tap at water office, public supply	7/ 9/20	....	....	....	....	....	....	....	....	....	....	....	....	100,000	+	+	—	...
Phoenix	Tap at Victor clothing store, public supply	7/ 9/20	15.00	25.00	....	....	.004	.116	.002	.280	155.00	243.00	100.00	3.70	94,000	—	—	—	...
Phoenicia	Brook supply, public supply	10/27/20	Trace	Trace	....	....	.002	.016	.001	Trace	.40	16.90	13.00	2.10	450	+	+	—	...
Phoenicia	Spring, public supply	10/27/20	Trace	Trace	....	....	.002	.012	.001	Trace	.70	16.90	16.00	1.10	180	+	—	—	...
Pine Plains	Spring, public supply	5/27/20	[illegible]	Trace	....	....	.002	.074	[illegible]	.020	1.60	27.30	19.00	.80	300	—	—	—	...
Pine Plains	Well, public supply	5/27/20	[illegible]	20.00	....	....	.002	.012	.001	1.20	3.80	194.20	176.00	.30	1,700	+	—	—	...
Pine Plains	Tap, public supply	5/27/20	....	....	....	....	....	....	....	....	....	....	....	....	5	—	—	—	...
Plattsburgh	Tap, public supply	2/24/20	Trace	2.00	....	....	.010	.048	.001	.300	1.20	94.30	49.00	3.40	600	—	—	—	...
Plattsburgh	Scribner pond, public supply	6/15/20	5.00	Trace	....	....	.052	.080	.002	.200	.80	131.40	126.00	1.60	1,300	—	—	—	...
Plattsburgh	Distributing reservoir, public supply	6/15/20	10.00	20.00	....	....	.176	.222	.005	.060	.40	80.00	76.00	4.00	125	—	—	—	...
Plattsburgh	Distributing reservoir, public supply	8/21/20	15.00	Trace	....	....	.084	.316	.005	.020	.40	95.70	94.00	6.40	350	+	—	—	...
Plattsburgh	West brook, above reservoir No. 2, public supply	9/27/20	5.00	Trace	....	....	.002	.024	Trace	.080	.60	114.20	102.50	1.70	6,100	+	+	—	...
Plattsburgh	West brook reservoir No. 2, public supply	9/27/20	5.00	20.00	....	....	.102	.480	Trace	.060	1.10	94.20	91.50	10.40	....	....	....	....	...
Plattsburgh	Mead brook, public supply	9/27/20	....	....	....	....	....	....	....	....	....	....	....	....	4,900	+	+	—	...
Plattsburgh	Scribner's pond, public supply	9/27/20	....	....	....	....	....	....	....	....	....	....	....	....	2,100	—	—	—	...
Plattsburgh	Tap at Dr. La Rocque's office, public supply	9/27/20	....	....	....	....	....	....	....	....	....	....	....	....	1,000	—	—	—	...
Plattsburgh	Tap at hotel, public supply	9/27/20	....	....	....	....	....	....	....	....	....	....	....	....	700	+	+	—	...
Plattsburgh	Tap, public supply	12/13/20	Trace	10.00	....	....	.014	.116	.017	.200	[illegible]	114.20	106.00	2.60	325	—	—	—	...
Point O'Wood	Windmill from two wells	5/25/20	....	....	....	....	....	....	....	....	....	....	....	....	27,500	—	—	—	...
Point O'Wood	Tap, public supply	5/25/20	....	....	....	....	....	....	....	....	....	....	....	....	26,000	—	—	—	...
Point O'Wood	Water from four wells at pump house public supply	5/25/20	0	0	....	....	.004	.038	.001	.300	26.00	54.30	44.00	1.10	47,000	+	+	+	...
Point O'Wood	Wells 600 feet from wind mill, public supply	9/ 3/20	....	....	....	....	....	....	....	....	25.50	....	....	....	30,000	—	—	—	...
Point O'Wood	Wells pumped by wind mills	9/ 3/20	....	....	....	....	....	....	....	....	77.50	....	....	....	550,000	+	—	—	...
Point O'Wood	Wells 100 feet from windmill	9/ 3/20	....	....	....	....	....	....	....	....	325.00	....	....	....	500,000	—	—	—	...
Port Jefferson	Well, public supply	5/24/20	....	....	....	....	....	....	....	....	....	....	....	....	220	+	—	—	...
Port Jefferson	New well, public supply	5/26/20	....	....	....	....	....	....	....	....	....	....	....	....	240	+	+	+	...

Port Jefferson	Old well, public supply	6/24/20	0	0	...	...	.002	.002	.000	.020	6.00	15.60	13.00	.60	19	—	—	—	...
Port Jefferson	Well, public supply	6/24/20	...	...	...	...	...	...	...	...	...	...	...	...	65	—	—	—	...
Port Jervis	Neversink river at pumping station, public supply	5/18/20	...	...	...	...	...	...	...	...	...	...	...	...	2,600	+	+	+	...
Port Jervis	Distributing reservoir, public supply	5/18/20	...	...	...	...	...	...	...	...	...	...	...	...	850	+	+	—	...
Port Jervis	Tap, public supply	5/18/20	10.00	Trace	...	...	.004	.064	.003	Trace	1.00	11.10	7.00	2.60	7,300	+	—	—	...
Port Jervis	Tap, public supply	10/30/20	25.00	5.00	...	...	.002	.092	.006	.060	0.60	15.60	7.50	6.90	35,000	+	—	—	...
Port Washington	Tap at pumping station, public supply	6/18/20	0	0	...	...	.002	.002	.000	.500	7.00	40.30	40.00	1.00	121,000	+	+	+	...
Port Washington	Tap at drug store, public supply	6/18/20	...	...	...	...	...	...	...	...	...	...	...	...	7,900	—	—	—	...
Poughkeepsie (Hudson River State Hospital)	Raw Hudson river water	4/ 8/20	25.00	50.00	...	...	.012	.110	.003	.200	2.00	27.30	27.00	5.60	14,000	+	+	+	...
Poughkeepsie (Hudson River State Hospital)	Filtered water	4/ 8/20	10.00	5.00	...	...	.008	.054	Trace	.300	2.20	27.30	25.00	2.30	30	—	—	—	...
Poughkeepsie (Hudson River State Hospital)	Well at Moor's farm	4/ 8/20	...	...	...	...	...	...	...	...	5.00	...	...	...	190	—	—	—	...
Poughkeepsie (Hudson River State Hospital)	Well at Travis' farm	4/ 8/20	...	...	...	...	...	...	...	...	5.00	...	...	...	20	—	—	—	...
Poughkeepsie (Hudson River State Hospital)	Cistern water at Winslow farm	4/ 8/20	...	...	...	...	...	...	...	...	2.00	...	...	...	14,000	—	—	—	...
Poughkeepsie	Raw water, suction well, public supply	10/29/20	...	...	...	...	...	...	...	...	...	...	...	...	5,700	+	+	+	...
Poughkeepsie	Settled water before pre-filtering, public supply	10/29/20	...	...	...	...	...	...	...	...	...	...	...	...	850	+	+	+	...
Poughkeepsie	Tap, public supply	10/29/20	5.00	Trace	...	...	.002	.036	.001	.200	4.20	67.10	49.00	5.90	13	—	—	—	...
Poughkeepsie (Hudson River State Hospital)	Brook	12/15/20	Trace	3.00	...	...	.480	.092	.003	2.00	6.60	134.20	111.00	2.10	5,400	+	+	—	...
Promised Land	North well, brick, three feet in diameter, five feet deep	6/ 5/20	...	...	...	...	...	...	...	...	...	...	...	...	2,600	—	+	—	...
Promised Land	Well, six feet, two inches in diameter	6/ 5/20	...	...	...	...	...	...	...	...	...	...	...	...	,750	+	+	—	...
Promised Land	Well, Gould land, pump	6/ 5/20	...	...	...	...	...	...	...	...	...	...	...	...	490	+	+	+	...
Promised Land	Well, windmill, Triton factory	6/ 5/20	...	...	...	...	...	...	...	...	...	...	...	...	45	—	—	—	...
Quogue	Tap at pumping station, public supply	6/ 9/20	0	0	...	...	.002	.002	.000	Trace	9.00	6.30	5.00	.30	...	—	—	—	...
Quogue	Stand pipe, public supply	6/ 9/20	...	...	...	...	...	...	...	...	...	...	...	...	0	—	—	—	...
Quogue	Tap on pump for wells	6/ 9/20	...	...	...	...	...	...	...	...	...	...	...	...	5	—	—	—	...
Quogue	Tap in village, public supply	6/ 9/20	...	...	...	...	...	...	...	...	...	...	...	...	1	—	—	—	...
Randall's Island (House of Refuge)	Tap in boys' kitchen	11/18/20	10.00	Trace	...	...	.002	.058	.006	.100	3.00	44.30	31.00	4.20	16	+	+	—	...
Randall's Island (House of Refuge)	Tap at first division dining room	11/18/20	...	...	...	...	...	...	...	...	...	...	...	...	17	+	—	+	...
Randall's Island (House of Refuge)	Tap, second division dining room	11/18/20	...	...	...	...	...	...	...	...	...	...	...	...	13	+	—	—	...
Ray Brook (New York State Hospital for Treatment of Incipient Tuberculosis)	Tap	6/ 7/20	15.00	0	...	...	.004	.060	Trace	.100	.20	22.10	8.00	4.80	4,300	+	—	—	...
Red Hook	Reservoir, public supply	4/27/20	...	...	...	...	...	...	...	...	...	...	...	...	450	—	—	—	...
Red Hook	Tap at pumping station, public supply	4/27/20	...	...	...	...	...	...	...	...	...	...	...	...	10,500	—	—	—	...
Red Hook	Tap, public supply	4/27/20	...	...	...	...	...	...	...	...	...	...	...	...	30,500	—	—	—	...
Red Hook	Tap, public supply	5/ 5/20	0	0	...	...	.008	.022	.015	.400	4.00	180.00	111.00	1.40	...	...	...	...	...

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Continued*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Rensselaer	Raw water, public supply	5/12/20	30.00	10.00	.....	.....	.036	.134	.010	.100	2.60	45.70	30.00	10.70	7,800	...	...	+	+
Rensselaer	Raw water, preliminary chlorination and alum added, public supply	5/12/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	+	+	—	...
Rensselaer	Filtered water before final chlorination, public supply	5/12/20	0	Trace	.....	.....	.008	.050	.001	.140	2.60	45.70	29.00	3.40	60	—	—	—	...
Rensselaer	Filtered and chlorinated water, public supply	5/12/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	—	—	—	...
Rhinebeck	Hydrant near pumping station, public supply	10/27/20	0	Trace	.....	.....	.004	.002	.003	.140	2.00	142.80	133.50	.90	7,000	+	—	—	...
Rhinebeck	Well No. 1, public supply	10/27/20	.....	.....	.....	.....	.....	.....	.....	.....	5.00	.....	.....	.....	11,500	+	—	—	...
Rhinebeck	Well No. 2, public supply	10/27/20	.....	.....	.....	.....	.....	.....	.....	.....	3.00	.....	.....	.....	900	—	—	—	...
Richmondville	Reservoir spillway, public supply	10/16/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	425	+	+	—	...
Richmondville	Tap, public supply	10/16/20	5.00	Trace	.....	.....	.002	.022	.002	.10	1.40	35.10	31.00	1.35	5,300	+	+	—	...
Riverhead	Raw water at pumping station, public supply	6/11/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	600	—	—	—	...
Riverhead	Raw water at pumping station after aeration and sedimentation, public supply	6/11/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	190	—	—	—	...
Riverhead	Filtered water at pumping station, public supply	6/11/20	0	0	.....	.....	.002	.004	.003	.020	7.00	26.00	26.00	.60	40	—	—	—	...
Rochester (State Hospital)	Tap in power house, well water	3/27/20	0	0	.....	.....	.002	.022	.003	1.00	20.00	483.50	244.00	1.30	90	—	—	—	...
Rochester (State Hospital)	Tap in kitchen at farm	3/27/20	0	0	.....	.....	.002	.026	.00[illegible]	.600	3.20	168.60	153.00	1.10	1,800	—	—	—	...
Rochester (State Hospital)	Tap at Dr. Potter's residence, city supply	3/27/20	5.00	5.00	.....	.....	.004	.102	Trace	.200	10.20	74.30	56.00	2.60	4,000	—	—	—	...
Rockaway Park	Raw water at pumping station, public supply	8/9/20	0	110.00	.....	.....	.060	.002	.002	.200	59.00	22.10	11.00	.40	6,300	+	+	—	...
Rockaway Park	Filtered water at pumping station, public supply	8/9/20	0	0	.....	.....	.054	.006	.002	.200	59.00	16.90	10.50	.20	210	+	—	—	...
Rockaway Park	Tap in village, public supply	8/9/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	68	—	—	—	...
Rockville Center	Driven well, public supply	1/13/20	0	0	.....	.....	.046	.026	.000	5.00	14.00	32.50	6.00	.60	5	—	—	—	...
Rockville Center	Tap at pumping station, public supply	5/21/20	0	Trace	.....	.....	.010	.048	.002	5.00	14.00	40.30	6.00	.40	.....	...	...	...	...
Rockville Center	Discharge of pump, public supply	5/21/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	—	—	—	...

Rockville Center	Pumping station, suction, public supply	5/21/20													0	—	—	—	...
Rockville Center	Tap, public supply	5/21/20													5	—	—	—	...
Rome	Reservoir, public supply	6/ 7/20													15,500	+	—	—	...
Rome	Tap after treatment, public supply	6/ 7/20													5	—	—	—	...
Rome	Reservoir before chlorination, public supply	11/27/20													5,500	+	+	—	...
Rome	Water after chlorination, public supply	11/27/20													14	—	—	—	...
Rome	Tap about 5 miles from chlorination point, public supply	11/27/20													18	—	—	—	...
Rome (State School)	Talcott farm drinking supply	12/24/20													6,300	—	—	—	...
Rome (State School)	Talcott farm, well near barn	12/24/20		0							15.00				1,000	—	—	—	...
Rome (State School)	Stork's farm well at horse barn	12/24/20		0							6.00				4,100	—	—	—	...
Rome (State School)	Stork's farm well near house	12/24/20		0							4.00				10	—	—	—	...
Rome (State School)	Tap at Brush farm	12/24/20													400	+	+	+	...
Rome (State School)	Well at Brush farm	12/24/20		0							12.00				2,000	—	—	—	...
Rome (State School)	Well at Bailey farm	12/24/20		0							43.00				33,500	+	—	—	...
Rome (State School)	Tap, city supply	12/24/20	55	0			.012	.114	.006	.300	2.20	27.30	20.00	7.40	500	—	—	—	...
Rome (State School)	Tap, filtered city supply	12/24/20	55	0			.008	.112	.010	.300	2.20	22.10	19.00	7.80	900	+	—	—	...
Roosevelt	Tap at pumping station, public supply	5/25/20	0	0			.002	.002	.001	4.00	13.00	42.90	5.00	.10	3,300	—	—	—	...
Roosevelt	Tap in village, public supply	5/25/20													2,400	—	—	—	...
Roscoe	Tap, public supply	11/ 1/20	35	Trace			.002	.076	.008	.200	2.40	18.20	10.00	7.50	18,000	+	+	—	...
Roslyn	Tap at pumping station, public supply	6/17/20	0	0			.002	.002	.001	.400	10.00	11.10	11.00	.10	153	—	—	—	...
Roslyn	Tap at railroad station, public supply	6/17/20													346	—	—	—	...
Rouses Point	Tap at pumping station, public supply	6/30/20													70,000	—	—	—	...
Rouses Point	Tap at express office, public supply	6/30/20	5	Trace			.006	.104	.030	.060	.80	42.90	40.00	4.40	12,000	—	—	—	...
Sag Harbor	Creek intake, public supply	1/10/20	35	Trace			.008	.226	Trace	.060	11.00	11.10	11.00	4.70					...
Sag Harbor	Tap at pumping station, public supply	1/10/20	25	1,000			.046	.158	.010	.100	11.00	15.60	12.00	3.50	950	—	—	—	...
Sag Harbor	Tap at pumping station, public supply	1/10/20													700	—	—	—	...
Sag Harbor	Tap at railroad station, public supply	1/10/20	35	3			.012	.176	Trace	.060	10.00	16.90	12.00	5.10	130	—	—	—	...
Sag Harbor	Creek at intake, public supply	6/ 7/20	30	0			.014	.166	Trace	.020	8.00	12.70	9.00	6.80	1,400	+	—	—	...
Sag Harbor	Tap at pumping station, public supply	6/ 7/20													3,700	—	—	—	...
Sag Harbor	Stream and well combined at pumping station, public supply	6/ 7/20	30	0			.014	.146	.001	.020	10.00	15.60	10.00	6.30					...
Sag Harbor	Tap in village, public supply	6/ 7/20													11,500	—	—	—	...
Salamanca	Tap, Newton Run brook, public supply	12/22/20	Trace	0			.002	.014	[illegible]	.100	1.30	15.60	14.00	1.40	3,000	—	—	—	...
Salamanca	Erie railroad supply, public supply	12/22/20	0	0			.002	.002	.003	.700	7.80	[illegible]	100.00	1.30	180	—	—	—	...
Salamanca	Tap, B. R. & P. R. R., public supply	12/22/20	0	0			.002	.002	[illegible]	.800	3.60	108.60	99.00	.30	550	—	—	—	...
Salamanca	Tap, well supply, public supply	12/22/20	Trace	0			.002	.020	[illegible]	.100	2.90	23.40	22.00	2.00	2,600	—	—	—	...
Saltair	Tap on well, public supply	6/19/20	15	20			.006	.002	.001	.020	6.00	1.60	18.00	.30	1	—	—	—	...
Saltair	Water after filtration	6/19/20													0	—	—	—	...
Saltair	Village pump, public supply	6/19/20													475	—	—	—	...
Saratoga	Tap at Public Works office, public supply	5/11/20	5	Trace			.014	.092	Trace	Trace	1.60	61.40	51.00	1.60	2,600	—	—	—	...
Saratoga	Tap at City Hall, public supply	5/11/20													6,200	—	—	—	...
Saratoga	Tap at No. 13 Caroline St., public supply	5/11/20													7,000	—	—	—	...
Saratoga	Raw water at Loughberry Lake reservoir, public supply	11/ 9/20													1,600	+	—	—	...

ANALYTICAL RESULTS OF SAMPLES OF WATER — (Continued)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c	1-100 c.c.
Saratoga	Tap at No. 10 Stratton St., public supply	11/ 9/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30,000	—	—	—	...
Saratoga	Tap at No. 22 Caroline St., public supply	11/ 9/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,000	—	—	—	...
Saratoga	Tap at City Hall, public supply	11/ 9/20	Trace	2	.....	.....	.070	.076	.003	.200	1.90	76.00	72.50	2.30	6,100	—	—	—	...
Saugerties	Reservoir in spillway, public supply	10/16/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,300	+	—	—	...
Saugerties	Tap, public supply	10/16/20	5	Trace	.....	.....	.002	.014	.002	.10	1.60	14.30	11.00	.40	21,000	+	—	—	...
Scarsdale	Tap at Mr. Hastings' residence, public supply	9/ 2/20	5	Trace	.....	.....	.002	.068	.002	.020	4.30	50.00	39.50	2.45	1,300	—	—	—	...
Scarsdale	Tap at Mr. Kuss' residence, public supply	9/ 2/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	—	—	—	...
Schenectady (Glenridge Sanatorium)	Raw intake well	1/16/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,600	+	+	—	...
Schenectady (Glenridge Sanatorium)	Tap in incipient building No. 2, "A"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	350	+	+	—	...
Schenectady (Glenridge Sanatorium)	Tap in incipient building No. 2 "C"	1/16/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	450	+	+	+	...
Schenectady (Glenridge Sanatorium)	Tap in administration building	1/16/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,300	+	+	+	...
Schenectady	Tap on pump discharge at waterworks building pump, public supply	3/21/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	+	+	—	...
Schenectady	Tap at N. Y. C. R. R. station, public supply	3/21/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22	+	—	—	...
Schenectady	Tap at Dr. Collin's residence public supply	3/21/20	0	0	.....	.....	.004	.024	.001	.700	5.80	139.20	91.00	1.50	120	+	+	+	...
Schenectady	Well No. 1 at pumping station, public supply	3/24/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	+	+	—	...
Schenectady	Well No. 2 at pumping station, public supply	3/24/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	+	—	—	...
Schenectady	Tap on main discharge, public supply	3/24/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	+	—	—	...
Schenectady	Tap at public works office, public supply	3/24/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	+	—	—	...
Schenectady	Tap, public supply	11/ 1/20	Trace	0	.....	.....	.002	.012	Trace	.200	4.20	140.00	122.00	1.50	1	—	—	—	...
Schenevus	Brook supply, public supply	10/20/20	5	Trace	.....	.....	.002	.034	Trace	.060	.40	19.50	14.00	1.80	200,000	+	+	—	...
Schenevus	Spring, public supply	10/20/20	Trace	Trace	.....	.....	.002	.010	Trace	.200	.60	18.20	13.00	1.20	500	+	—	—	...

Schoharie	Fox creek, public supply	10/15/20	5	Trace			.002	.048	.002	.14	1.50	128.60	124.00	2.80	400	+	+	+	
Schoharie	Spring, public supply	10/15/20	Trace	0			.002	.010	.001	.70	1.00	188.50	168.00	2.10	4,600	+	+	—	
Schroon Lake	Reservoir at intake, public supply	8/ 2/20													1,600	+	+	—	
Schroon Lake	Butler pond, overflow at reservoir, public supply	8/ 2/20	10	Trace			.004	.116	.005	.100	1.00	15.60	13.50	3.10	50	—	—	—	
Schroon Lake	Tap, mixed supply public supply	8/ 2/20	10	Trace			.004	.082	.005	.100	1.00	19.50	18.00	3.70	500	+	—	—	
Sea Cliff	Tap at pumping station, public supply	6/16/20	0	0			.002	.002	.001	2.40	9.00	27.30	20.00	.10					
Sea Cliff	Tap on pump house, public supply	6/16/20													7,300	—	—	—	
Sea Cliff	Tap on pump, public supply	6/16/20													1,700	—	—	—	
Sea Cliff	Tap at drug store, public supply	6/16/20													2,500	—	—	—	
Seneca Falls	Raw lake water, public supply	4/ 2/20											80.00		1,600	+	+	—	
Seneca Falls	Raw water at pumping station, public supply	4/ 2/20													450	+	—	—	
Seneca Falls	Tap at pumping station, filtered water, public supply	4/ 2/20											100.00		250	+	+	—	
Seneca Falls	Tap in Gould hotel, public supply	4/ 2/20													60	—	—	—	
Seneca Falls	Tap at first ward school, public supply	9/10/20														—	—	—	
Seneca Falls	Tap at Mrs. Leam's residence, public supply	9/10/20														—	—	—	
Seneca Falls	Tap at Northnagle residence, public supply	9/10/20														+	—	—	
Seneca Falls	Tap at Malone residence, public supply	9/10/20													6.70	—	—	—	
Seneca Falls	Tap at Seneca Falls Manufacturing Co., public supply	9/10/20													6,700	—	—	—	
Sharon Springs	South spring above reservoir, public supply	10/ 9/20													110	+	+	—	
Sharon Springs	Overflow of north spring, public supply	10/ 9/20													650	+	+	+	
Sharon Springs	Raw water at filter plant, public supply	10/ 9/20	5	Trace			.002	.138	.002	.10	.90	91.40	89.50	4.20	400	+	—	—	
Sharon Springs	Filtered water at filter plant, public supply	10/ 9/20													150	+	—	—	
Sharon Springs	Tap in village, filtered water, public supply	10/ 9/20	5	0			.002	.104	.001	.14	.90	84.30	70.00	3.90	850	+	—	—	
Shelter Island Heights	Tap on pump No. 1, public supply	6/14/20	0	0			.004	.010	.001	.500	156.00	87.10	25.00	.30					
Shelter Island Heights	Tap on pumping station No. 3	6/14/20													89	—	—	—	
Shelter Island Heights	Tap on pumping station No. 2	6/14/20													30,000	—	—	—	
Shelter Island Heights	Tap opposite pumping station No. 1	6/14/20													1,690	—	—	—	
Shelter Island Heights	No. 1 and No. 2 combined village tap, public supply	6/14/20													163	+	+	—	
Sherburne	Reservoir, public supply	12/10/20													300	+	+	—	
Sherburne	Well, public supply										13.80				0	—	—	—	
Sherburne	Well for fire use only	12/31/20	0	0			.056	.036	.002	.200	6.40	328.50	258.00	1.70					
Sherburne	Tap, public supply	12/31/20	20	60			.024	.104	.008	.200	2.20	51.40	47.00	5.50					
Shortsville	Collecting well, public supply	9/25/20													28,000	+	+	—	
Shortsville	Well No. 1	12/22/20	0	0			.001	.054	Trace	.600	4.20	335.50	224.00	.10	25	—	—	—	
Shortsville	Well No. 2	12/22/20	0	0			.002	.024	.003	2.80	3.70	261.50	244.00	.20	200	—	—	—	
Shortsville	Tap at railroad station	12/22/20													325	—	—	—	
Silver Springs	Spring, public supply	10/23/20									4.50				150	—	—	—	
Silver Springs	Tile overflow into system, public supply	10/23/20									3.00				50	+	+	—	

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Continued*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Nitrogen as — Albuminoid ammonia	Nitrogen as — Nitrites	Nitrogen as — Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+= Present) (—= Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Skaneateles	Tap at Wallace's store, public supply	5/ 1/20	0	Trace	.....	.....	.002	.044	.001	.300	1.60	181.50	92.00	1.00	160	—	—	—	...
Skaneateles	Tap at Jordan street, public supply	5/ 1/20	[illegible]	Trace	.....	.....	.006	.034	.001	.300	1.80	100.00	92.00	1.00	.....	...	...	...	...
Smyrna	Springs, public supply	12/10/20	0	0	.....	.....	.002	.036	.005	.200	.60	45.70	43.00	1.20	300	+	+	—	...
Smyrna	Reservoir, public supply	12/10/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	120	+	—	—	...
Smyrna	Tap at railroad station, public supply	12/10/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	—	—	—	...
Smyrna	Well, public supply	12/10/20	0	0	.....	.....	.002	.026	.000	5.60	20.00	[illegible]4.50	36.00	.40	15	—	—	—	...
Sodus Point	Main well, public supply	6/ 1/20	0	3	.....	.....	.014	.088	.007	.500	68.00	160.00	158.00	2.00	750	—	—	—	...
Sodus Point	Well at Harris house, public supply	6/ 1/20	5	40	.....	.....	.034	.028	.001	.020	34.00	39.00	.....	.90	22,000	—	—	—	...
Sonyea (Craig Colony)	Raw water from creek	6/29/20	5	5	.....	.....	.012	.092	.001	.020	8.00	162.80	141.00	1.70	300	+	—	—	...
Sonyea (Craig Colony)	Water softened but not filtered	6/29/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	700	—	—	—	...
Sonyea (Craig Colony)	Water softened and filtered	6/29/20	0	0	.....	.....	.024	.056	.001	.020	8.00	35.10	.....	1.30	45	—	—	—	...
Sonyea (Craig Colony)	Chlorinated	6/29/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32,000	—	—	—	...
Southampton	Tap at pumping station, public supply	6/ 9/20	0	0	.....	.....	.002	.004	.000	1.20	12.00	19.50	11.00	.10	118	—	—	—	...
Southampton	Tap at hotel, public supply	6/ 9/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	33	—	—	—	...
South New Berlin	Glover Springs, public supply	11/26/20	.....	.....	.....	.....	.....	.....	.....	.....	6.00	.....	.....	.....	2,400	+	+	+	...
South New Berlin	Owen Springs, public supply	11/26/20	.....	.....	.....	.....	.....	.....	.....	.....	2.00	.....	.....	.....	700	+	—	—	...
South New Berlin	Tap at R. R. station, public supply	11/26/20	0	0	.....	.....	.002	.002	.001	.800	1.40	32.50	27.00	.50	30	+	+	—	...
Spring Valley	Tap, public supply	7/19/20	0	0	.....	.....	.002	.002	.001	1.20	5.60	105.80	90.50	.40	228,000	—	—	—	...
Springville (Institute for study of malignant diseases)	Tap in bungalow	7/27/20	0	0	.....	.....	.008	.020	Trace	2.400	3.00	41.60	36.00	1.40	3,500	—	—	—	...
Springville (Institute for study of malignant diseases)	Tap in kitchen	8/10/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	350	—	—	—	...
Staatsburgh	Raw water, public supply	10/27/20	30	0	.....	.....	.002	.178	.005	.120	2.40	68.60	60.00	9.20	210	+	—	—	...
Staatsburgh	Clear water reservoir, public supply	10/27/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	160	—	—	—	...
Staatsburgh	Tap, public supply	10/27/20	15	0	.....	.....	.002	.074	.005	.080	2.40	68.60	64.00	6.80	120	—	—	—	...
Suffern	Raw lake water, public supply	6/28/20	20	Trace	.....	.....	.050	.104	.002	.100	1.20	62.90	57.00	3.10	.....	...	...	...	...
Suffern	Chlorinated well water, public supply	6/28/20	0	10	.....	.....	.004	.002	.010	.300	6.00	67.10	.....	1.40	.....	...	...	...	...
Suffern	New well, public supply	9/ 4/20	Trace	5	.....	.....	.002	.004	.009	.060	2.60	80.60	77.00	.70	60	+	—	—	...
Suffern	Raw Mahwah river water, public supply	9/ 4/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000	+	—	—	...
Suffern	Filtered and chlorinated water, public supply	9/ 4/20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,600	—	—	—	...

Suffern	Raw well water, public supply	11/ 3/20													10	−	−	−	
Suffern	Raw lake water, public supply	11/ 3/20													30	−	−	−	
Suffern	Filtered water, public supply	11/ 3/20													20	−	−	−	
Suffern	Filtered water, public supply	11/ 3/20													35	−	−	−	
Summitville	Intake reservoir, public supply	5/15/20													2,800	+	+	−	
Summitville	Tap at N. Y. O. and W. R. R. station, public supply	5/15/20	0	Trace			.002	.036	Trace	Trace	.80	9.50	5.00	.50		+	−	−	
Summitville	Tap at depot, public supply	10/27/20	Trace	0			.002	.010	.001	.020	1.10	14.30	13.50	1.30	75	+	+	−	
Syracuse (State Institution for Feeble-Minded Children)	Well at teamsters cottage	12/28/20									11				30	−	−	−	
Syracuse (State Institution for Feeble-Minded Children)	Well, main form supply	12/28/20	0	0			.002	.030	.003	4.00	3.20	643	253	.80	30	−	−	−	
Syracuse (State Institution for Feeble-Minded Children)	Main supply, city water	12/28/20	0	0			.004	.040	Trace	.200	1.80	102.80	96.00	1.00	700	+	−	−	
Tannersville	Tap, public supply	10/16/20	15	0			.002	.042	.003	.08	.60	14.30	7.00	5.00	2,500	−	−	−	
Thiells (Letchworth Village)	West stream feeding reservoir	1/30/20	15	Trace	34		.004	.042	.000	.060	2.00	16.90	7.00	3.00	60	−	−	−	
Thiells (Letchworth Village)	North stream feeding reservoir	1/30/20	Trace	Trace	28		.002	.038	.000	.020	2.20	12.70	9.00	1.20	50	−	−	−	
Thiells (Letchworth Village)	Tap at office building	1/30/20	15	Trace	33		.002	.052	.000	.040	2.20	14.30	12.00	1.40	40	−	−	−	
Thiells (Letchworth Village)	Tap in D. building, hot water	1/30/20	20	Trace	35		.026	.058	.001	.040	2.00	14.30	11.00	2.20					
Tonawanda	Tap at Waterworks, public supply	2/ 3/20													1	−	−	−	
Tonawanda	Tap at Fries' drug store, public supply	2/ 3/20													2	−	−	−	
Tonawanda	Pump discharge, chlorinated water, public supply	3/22/20													2	−	−	−	
Tonawanda	Tap at pump discharge, public supply	4/ 6/20													12	−	−	−	
Tonawanda	Water 200 feet from shore, 13 feet below surface, public supply	6/15/20													7,500	+	+	+	+
Tonawanda	Canal overflow at pumping station, public supply	6/15/20													9,700	+	+	+	
Tonawanda	Raw water at intake well, public supply	6/15/20													850	−	−	−	
Tonawanda	Chlorinated water at pump discharge, public supply	6/15/20													90	−	−	−	
Tonawanda	Water at intake crib, 8 feet below surface, public supply	6/15/20													37,000	−	−	−	
Tonawanda	Water 100 feet from intake crib, 18 feet below surface	6/15/20													1,500	−	−	−	
Tonawanda	Water 400 feet from intake, 900 feet from shore, 18 feet below surface	6/15/20													2,500	+	+	−	
Tonawanda	Water 800 feet from intake, 150 feet from shore, 17 feet below surface	6/15/20													2,500	+	+	−	
Tonawanda	Water 600 feet from shore, 17 feet below surface	6/15/20													1,600	+	+	−	
Tonawanda	Raw water from intake well, public supply	10/21/20													100	+	+	−	
Tonawanda	Pump discharge, chlorinated water public supply	10/21/20													60	−	−	−	
Tonawanda	Tap, public supply	10/21/20													3,200	−	−	−	
Tully	Well, public supply	4/ 1/20	0	0			.002	.090	.001	5.00	16.00	321.50	242.00	.70	50	−	−	−	

ANALYTICAL RESULTS OF SAMPLES OF WATER — (Continued)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	NITROGEN AS — Free ammonia	Albuminoid ammonia	Nitrites	Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. COLI TYPE (+ = Present) (— = Absent) 10 c.c.	1-c.c.	1 10 c.c.	1-100 c.c.
Tully	Reservoir, public supply	12/17/20	...	...	...	...	...	...	...	...	...	...	...	...	110	—	—	—	...
Tully	Tap at pumping station, public supply	12/17/20	0	0	...	...	.002	.024	.002	3.20	13.00	250.00	234.00	1.20	90	—	—	—	...
Tuxedo	Tap on pump, public supply	12/13/20	...	...	...	...	...	...	...	...	...	...	...	...	375	—	—	—	...
Tuxedo	Park supply, public supply	12/13/20	...	...	...	...	...	...	...	...	...	...	...	...	5	—	—	—	...
Tuxedo	Tap, public supply	12/13/20	5	Trace	...	...	.008	.074	.000	.060	2.00	26.00	17.00	2.30	1,400	+	—	—	...
Utica (State Hospital)	Creek proposed supply for New Marcy Division Development	11/23/20	50	375	...	...	.002	.180	.007	.140	1.80	32.50	16.00	17.20	6,400	+	+	+	...
Utica (State Hospital)	Tap at hospital, city supply	11/23/20	40	5	...	...	.002	.066	.005	.160	1.40	27.30	16.00	9.40	12,500	—	—	—	...
Valley Junction	Tap, public supply	5/17/20	0	0	...	...	.002	.020	.001	.400	2.20	19.50	14.00	.20	3,000	—	—	—	...
Valley Stream	Raw water	5/22/20	...	...	...	...	...	...	...	...	...	...	...	...	0	—	—	—	...
Valley Stream	Filtered water at pumping station, public supply	5/22/20	0	0	...	...	.002	.022	.00	Trace	5.00	12.70	11.00	.20	1	—	—	—	...
Valley Stream	Tap in village	5/22/20	...	...	...	...	...	...	...	...	...	...	...	...	2	—	—	—	...
Ward's Island (Manhattan State Hospital)	Main E	7/17/20	...	...	...	...	...	...	...	...	...	...	...	...	24	—	—	—	...
Ward's Island (Manhattan State Hospital)	Laboratory	7/17/20	...	...	...	...	...	...	...	...	...	...	...	...	18	+	+	+	...
Ward's Island (Manhattan State Hospital)	Kalmer	7/17/20	...	...	...	...	...	...	...	...	...	...	...	...	104	+	+	+	...
Ward's Island (Manhattan State Hospital)	Staff H	7/17/20	...	...	...	...	...	...	...	...	...	...	...	...	94	+	+	+	...
Ward's Island (Manhattan State Hospital)	Tap at store-house	12/9/20	...	...	...	...	...	...	...	...	...	...	...	...	62	—	—	—	...
Wassaic	Tap, public supply	5/29/20	0	0	...	...	.002	.006	.00	.040	2.00	57.10	55.00	.70	3,400	+	—	—	...
Watervliet (Arsenal)	Tap at pumping station, public supply	6/17/20	35	20	...	...	.092	.202	.002	.100	5.60	68.60	59.00	19.00	9	+	—	—	...
Watervliet	Tap at city hall, public supply	6/17/20	...	...	...	...	...	...	...	...	...	...	...	...	230	+	+	—	...
Watervliet	Raw water at filter plant, public supply	7/3/20	30	10	...	...	.008	.220	.003	.300	1.80	74.30	57.00	5.20	400	+	—	—	...
Watervliet	Influent to filters, public supply	7/3/20	...	...	...	...	...	...	...	...	...	...	...	...	650	+	+	—	...
Watervliet	Filtered water pipe line leading to clear water reservoir, public supply	7/3/20	20	2	...	...	.006	.174	.001	.400	1.80	74.30	56.00	3.50	150	—	—	—	...
Watervliet	Tap at second house below filter plant public supply	7/3/20	...	...	...	...	...	...	...	...	...	...	...	...	5	—	—	—	...

Watervliet	Tap at city hall, public supply	7/ 3/20													49	—	—	—	
Town of Webb	Tap at pond, public supply	8/16/20	110	Trace			.002	.152	.005	.200	3.00	29.90	20.00	17.40	800	+	—	—	
Town of Webb	Tap, public supply	8/16/20													1,300	—	—	—	
Wellsville	Raw Genesee river water, public supply	3/24/20													29,000	+	+	—	
Wellsville	Filtered and chlorinated water, public supply	3/24/20													900	+	—	—	
Wellsville	Tap at pumping station, public supply	4/ 6/20													180	—	—	—	
Wellsville	Tap at corner of Brooklyn and Stevens streets, public supply	4/ 6/20													120	—	—	—	
Wellsville	Tap at 24 Madison street, public supply	4/ 6/20													120	—	—	—	
Wellsville	Tap at Chestnut street, public supply	4/ 6/20													95	—	—	—	
Wellsville	Tap at East Fassett street, public supply	4/ 6/20													150	—	—	—	
Wellsville	Tap at pumping station, public supply	4/10/20													220	—	—	—	
Wellsville	Tap at Madison street, public supply	4/10/20													950	—	—	—	
Wellsville	Tap at Hanover street, public supply	4/10/20													400	—	—	—	
Wellsvi e	Tap at North Main street, public supply	4/10/20													300	—	—	—	
Wellsville	Tap at pumping station, public supply	4/23/20													600	+	—	—	
Wellsville	Tap at 20 Hanover street, public supply	4/23/20													240	—	—	—	
Wellsville	Tap at 140 West State street, public supply	4/23/20													1,700	+	—	—	
Wellsville	Tap at 28 Martin street, public supply	4/23/20													15	—	—	—	
Wellsville	Tap at 36 North Broad street, public supply	4/23/20													750	+	—	—	
Westbury	Combined wells at pumping station, public supply	6/ 1/20	0	0			.002	.014	.000	2.40	9.00	57.10	6.00	.10					
Westbury	Pumping station well No. 1, public supply	5/29/20													2	—	—	—	
Westbury	Pumping station well No. 2, public supply	5/29/20													1	—	—	—	
Westbury	Tap in village, public supply	5/29/20													520	—	—	—	
West Haverstraw (Hospital for Crippled and Deformed Children)	Tap in administration building	1/28/20	0	0			.004	.028	.001	.200	1.80	27.30	9.00	1.60	200	—	—	—	
West Haverstraw (Hospital for Crippled and Deformed Children)	Tap in office	1/28/20													150	+	—	—	
Westport	Lake water, public supply	9/ 8/20	10	Trace			.002	.072	.002	.120	1.60	45.70	45.50	3.00	20	—	—	—	
Willard (State Hospital)	Spring at Hillside cottage	1/ 2/20	0	0			.004	.058	.000	2.00	2.40	194.20	183.00	1.20	2,700	—	—	—	
Willard (State Hospital)	Spring supply at Maples cottage	1/ 2/20	0	0			.032	.086	.001	.500	1.40	357.00	283.00	1.00	10	—	—	—	
Willard (State Hospital)	Seneca Lake supply at Maples cottage	1/ 2/20	Trace	Trace			.002	.068	.000	.500	76.00	103.80	91.00	1.60	5	—	—	—	
Willard (State Hospital)	Lake supply at store building	1/ 2/20													10	—	—	—	
Willard (State Hospital)	Tap at Buttonwood spring	1/ 2/20	0	0			.002	.028	.001	.600	4.00	357.00	273.00	.60					
Willard (State Hospital)	Tap at Buttonwood spring	12/ 8/20	0	0			.002	.038	Trace	.400	2.40	378.50	267.00	.90	1,300	—	—	—	
Willard (State Hospital)	Spring at Hillside	12/ 8/20	0	0			.002	.014	Trace	2.50	2.00	293.00	172.00	1.30	11,500	+	+	—	
Willard (State Hospital)	Raw lake water	12/ 8/20													5,200	+	+	—	
Willard (State Hospital)	Chlorinated lake water, main supply	12/ 8/20	0	0			.002	.042	Trace	.300	71.00	435.50	111.00	1.90	200	—	—	—	
Williamson	Raw water at intake, public supply	7/21/20													2,300	—	—	—	
Williamson	Tap at pumping station, public supply	7/21/20	0	0			.006	.054	.001	.120	10.00	123.50	84.00	4.80					
Williamson	Tap at health officer's residence, public supply	7/21/20													325	—	—	—	

ANALYTICAL RESULTS OF SAMPLES OF WATER — (*Concluded*)

CITY, TOWN OR VILLAGE	Source	Date	Color	Turbidity	Residue on evaporation	Mineral residue	Nitrogen as — Free ammonia	Albuminoid ammonia	Nitrites	Nitrates	Chlorine	Hardness, total	Alkalinity	Oxygen consumed	Bacteria per c.c.	B. Coli Type (+ = Present) (— = Absent) 10 c.c.	1 c.c.	1-10 c.c.	1-100 c.c.
Windsor	Intake reservoir, public supply	5/20/20	Trace	Trace	....	....	.004	.086	Trace	.020	.40	18.20	7.00	.70	2,000	+	+	—	...
Windsor	Well, public supply	5/20/20	0	Trace	....	....	.002	.018	Trace	3.00	6.00	47.10	24.00	.20	750	+	+	—	...
Windsor	Tap, public supply	5/20/20	....	....	....	....	....	....	....	....	....	....	....	....	7,700	+	+	—	...
Wingdale (Prison)	Well at contractor's shack	12/10/20	....	....	....	....	....	....	....	....	....	....	....	....	30	—	—	—	...
Wingdale (Prison)	Well, farm supply	12/10/20	0	0	....	....	.002	.010	.000	.140	1.80	65.70	54.00	1.50	300	+	—	—	...
Wingdale (Prison)	Main, temporary supply	12/10/20	0	0	....	....	.002	.008	.000	.060	1.20	60.00	43.00	1.40	5	—	—	—	...
Wolcott	Main spring supply at reservoir, public supply	10/ 5/20	....	....	....	....	....	....	....	....	....	....	....	....	7,000	+	+	+	...
Wolcott	Tap at pumping station, public supply	10/ 5/20	Trace	Trace	....	....	.002	.002	.002	1.400	1.50	177.20	147.00	.70	3,000	+	+	+	...
Wolcott	Tap at Knapp's bakery, public supply	10/ 5/20	....	....	....	....	....	....	....	....	....	....	....	....	2,200	+	—	—	...
Woodlawn	Pump station, Western New York Water Co., public supply	12/13/20	....	....	....	....	....	....	....	....	....	....	....	....	30	—	—	—	...
Woodside	Pumping station, Citizens Water Co., public supply	5/13/20	....	....	....	....	....	....	....	....	....	....	....	....	44	—	—	—	...
Worcester	Overflow from intake basin, public supply	10/18/20	....	....	....	....	....	....	....	....	....	....	....	....	660	—	—	—	...
Worcester	Tap, public supply	10/18/20	5	0	....	....	.002	.068	.001	.06	.60	9.50	8.00	3.80	230	—	—	—	...
Wurtsboro	Stream, public supply	4/15/20	....	....	....	....	....	....	....	....	....	....	....	....	8,800	+	—	—	...
Wurtsboro	Inlet to reservoir, public supply	4/15/20	....	....	....	....	....	....	....	....	....	....	....	....	150	+	—	—	...
Wurtsboro	Reservoir, public supply	4/15/20	10	7	....	....	.004	.054	.003	.040	1.40	12.70	6.00	2.40	10,000	—	—	—	...
Wurtsboro	Tap, public supply	4/15/20	10	10	....	....	.006	.044	.001	.040	1.40	12.70	6.00	1.90	1,600	—	—	—	...
Youngstown	Raw water applied to filters, public supply	7/ 9/20	5	5	....	....	.046	.116	.001	.060	12.00	102.80	91.00	3.50	400	+	+	+	...
Youngstown	Water effluent of filters at pumping station, public supply	7/ 9/20	....	....	....	....	....	....	....	....	....	....	....	....	480	+	—	—	...
Youngstown	Tap, public supply	7/24/20	0	0	....	....	.022	.046	.003	.060	9.90	105.80	98.00	2.47	800	+	—	—	...

DIVISION OF VITAL STATISTICS

DIVISION OF VITAL STATISTICS

ALBANY, N. Y., *June* 1, 1922

HERMANN M. BIGGS, M. D., *State Commissioner of Health, Albany, N. Y.:*

DEAR SIR.— It is my privilege to transmit herewith the annual report of the Division of Vital Statistics for the calendar year 1920, which is the forty-first annual report of the State Department of Health on the registration of births, marriages, and deaths, and its thirty-sixth annual compilation of statistics of same.

I beg your attention to the special tables on Birth Statistics and Infant Mortality which appear for the first time in the present report. These tables are very comprehensive, giving births by age, color, nativity, and fecundity of mother; stillbirths by sex, legitimacy, age and nativity of mother; deaths of infants by important causes, for certain subdivisions of the first year of life, etc., etc. Many of these tables are correlations, i. e., age of mother according to age of father, number of child in order of birth according to country of birth of mother, etc.

Very truly yours

OTTO R. EICHEL

Director

INDEX

PAGE

Review of vital statistics for the year 1920, with table and chart showing the movement of mortality in New York State from important causes of death........ 227

TABLE — BIRTHS, DEATHS, AND MARRIAGES

1 Annual number of births, deaths, and marriages in the State of New York, with rates per 1,000 estimated population: 1885–1920.................. 239

2 Annual number of deaths in New York City and rest of State with death rates per 1,000 estimated population: 1898–1920............................ 240

3 Deaths in the entire State, New York City, and rest of State by sex, color, marital condition and general nativity: 1920........................... 241

4 Number and percentage of deaths at each age period in the entire State, New York City and rest of the State: 1920................................ 241

5 Number of deaths in the State (exclusive of New York City) by age period, sex, color, general nativity, and marital condition: 1920................. 243

6 Number of births, stillbirths, and deaths, with birth, death and infant mortality rate by months; deaths by broad age periods, and important causes by months; in entire State, New York City, and rest of the State: 1920...... 244

GENERAL TABLES OF BIRTHS AND INFANT MORTALITY

7a Total births in the State (exclusive of New York City): showing sex, month of birth, attendant at birth, age of mother, order of birth, legitimacy, and plural births, by color, nativity of mother and country of birth of white foreign-born mothers: 1920.............................. 251

7b Similar data for illegitimate living births: 1920.......................... 253

8 Number of births each month in the entire State, New York City and rest of State by sex and color; also number of stillbirths by months: 1920........ 254

9 Movement of infant and childhood mortality in the State of New York; showing annual number of births registered, deaths at all ages, deaths of infants under 1 year of age, deaths under 5 years, infant mortality rate and percentage of all deaths occurring under 1 year and under 5 years of age: 1885–1920... 256

10 Movement of infant and childhood mortality in New York City and rest of State, showing annual number of births registered, birth rates, deaths at all ages, deaths under 1 year of age and under 5 years, and infant mortality rates: 1905–1920... 257

DETAILED TABLES FOR CITIES, COUNTIES AND INDIVIDUAL REGISTRATION DISTRICTS

TABLE PAGE

11 General summary for New York City and rest of the State by individual counties: showing the number of births, stillbirths, deaths, and marriages with annual birth, death and marriage rates per 1,000 estimated population: 1920 258

12 General summary for each city of the State: showing the number of births, stillbirths, deaths, and deaths under 1 year during 1920 with corresponding birth and death rates for 1920 in comparison with 1913–1917; also infant mortality rates for 1920 and 1919 260

13 Deaths in each city of the State: classified by broad age periods and important causes; also by groups of cities and for total rural and urban areas outside New York City: 1920 264

14 Number of deaths from typhoid fever in each city of the State with annual death rates per 100,000 population: 1916–1920 274

15 Number of deaths from pulmonary tuberculosis in each city of the State with annual death rates per 100,000 population: 1916–1920 276

16 Number of deaths in each city and village of 2500 and over in the State with total for other villages and towns in each county, classified by broad age periods and important causes: 1920 278

17 Births, stillbirths, total deaths by selected age groups, and cases and deaths from important reportable and other diseases for each registration district (city, village and town) with separate statement for each State institution State of New York (exclusive of New York City): 1920 326

18 Deaths in State institutions (exclusive of New York City) classified by broad age periods and important causes: 1920 386

COMPARATIVE AND DETAILED TABLES OF BIRTHS AND DEATHS

19 Movement of mortality from the chief communicable diseases in New York State showing annual number of deaths and death rates per 100,000 population, 1885–1920; also for New York City and rest of State, 1898–1920 ... 392

20 Movement of mortality from certain important causes of death in New York State showing annual number of deaths and death rates per 100,000 population: 1900–1920 396

21 Movement of mortality from cancer and other malignant tumors in New York State showing the number of deaths and annual death rates per 100,000 popula ion according to the organ or part of body affected: 1907–1920 397

22 Number of deaths from each cause in the entire State, New York City and rest of State according to the Detailed International List of Causes of Death: 1920 398

TABLE PAGE

23 Deaths from each cause (Detailed International List) in the State outside of New York City, classified by age at death (5 year age periods) for each sex: 1920 402

24 Number of births in each city and the rest of each county in the State (outside of New York City) classified by nativity of white mothers and country of birth of foreign-born mothers; also births to colored mothers: 1920 418

25 Number of births in each city and the rest of each county in the State, classified by sex, legitimacy, plural births, attendant at birth, and month of occurrence; also for the entire State, New York City and rest of State: 1920 426

SPECIAL TABLES ON BIRTHS AND INFANT MORTALITY

I Number of deaths (exclusive of stillbirths) by age, sex, color, general nativity and by country of birth of foreign-born in the entire State (exclusive of New York City): 1920 444

II Number of births (exclusive of stillbirths) to native white mothers by age of mother according to the number of child in order of birth, for cities, etc., of New York State (exclusive of New York City) grouped according to size in population: 1920 446

III Number of births (exclusive of stillbirths) by color, general nativity of white mothers, and the country of birth of foreign-born white mothers according to the number of children born and the number of living at the time of, and including the 1920 birth in the entire State (exclusive of New York City): 1920 466

IV Number of births (exclusive of stillbirths) by sex and by the color, nativity and age of mother according to age of father in the entire State (exclusive of New York City): 1920 484

V Number of births (exclusive of stillbirths) with number of child in order of birth, by color and age of mother and for white children by country of birth of mother in the entire State (exclusive of New York City): 1920. 508

VI Number and distribution of stillbirths by sex, month of birth, attendant at birth, number of child in order of birth, age of mother, legitimacy and plural births, according to color and for white children by country of birth of mother in the entire State (exclusive of New York City): 1920 544

VII Number of deaths under one year of age from important causes, by sex, and for certain subdivisions of the first year of life in the entire State (exclusive of New York City): 1920 548

VIII Number of births, stillbirths, and deaths under one year of age; birth rate per 1,000 total population; stillbirths and death rates per 1,000 living births; infant mortality rates from important causes and for certain subdivisions of the first year of life in certain areas of New York State: 1920 and 1915–1919 average 550

TABLE PAGE

IX. Number of deaths (exclusive of stillbirths) from important causes and for certain subdivisions of the first year of life by sex and color, and for children of white mothers by country of birth of mothers in the entire State (exclusive of New York City): 1920 582

Population of counties and each primary registration district in New York State (exclusive of New York City) by censuses of 1920, 1915 and 1910 with district numbers prefixed 586

REVIEW OF THE VITAL STATISTICS FOR THE YEAR 1920

Population

The Federal census, taken as of January 1, 1920, showed a population of 10,385,227 for the State of New York, an increase of 1,271,613 or 14 per cent over 1910. While the percentage increase of 1910 over 1900 was 25.4, this slowing up in the last decennium was caused by the war and special immigration laws. This same slowing up was apparent in the figures for the United States as a whole.

POPULATION OF NEW YORK — 1790 to 1920.*

Census Year	Population	Increase over Preceding Census		Per cent of increase for the United States
		Number	Per cent	
1920	10,385,227	1,271,613	14.0	14.9
1910	9,113,614	1,844,720	25.4	21.0
1900	7,268,894	1,265,720	21.1	20.7
1890	6,003,174	920,303	18.1	25.5
1880	5,082,871	700,112	16.0	30.1
1870	4,382,759	502,024	12.9	22.6
1860	3,880,735	783,341	25.3	35.6
1850	3,097,394	668,473	27.5	35.9
1840	2,428,921	510,313	26.6	32.7
1830	1,918,608	545,796	39.8	33.5
1820	1,372,812	413,763	43.1	33.1
1810	959,049	369,998	62.8	36.4
1800	589,051	248,931	73.2	35.1
1790	340,120	....	....	....

* From New York State Legislative Manual, 1922, p. 190

The population of the State for the mid-census years has been revised on the 1910–1920 basis and new mortality rates have been figured on these revised population estimates. The estimates are made as of July first and the simple arithmetic method has been used.

Births

In 1920 there were registered 235,460 births in the entire State, 9,191 more than in 1919. The rates per 1,000 of the estimated population were 22.5 and 21.9 respectively — the increase in 1920 being 0.6 per thousand. This increase in the birth rate is the natural reaction after the war,— and it is manifest in the U. S. Registration Area and in England and Wales. However, our rate for 1920 is not as high as it was in any year between 1907 and 1919. The average annual rate for 1913–17 was 24.5.

The falling off in the rate during the war years will doubtless be compensated by an increase in the rate in the next few years.

Marriages

In 1920 there were registered in the State 111,280 marriages, 7,565 more than in 1919. The rate in 1920 was 21.3 persons married per thousand total population which is the highest rate on record for the State, except for the year 1907 when it was 21.5. This again shows the natural reaction from the war and corresponds with the increase in the birth rate.

For 1920 England reports its highest marriage rate on record — a rate of 20.1 per 1,000 of estimated population.

Deaths

General mortality. The total number of deaths in the entire State of New York in 1920 from all causes was 144,466. The corresponding death rate was 13.8 per 1,000 population, based upon an estimated mid-year population of 10,450,716. This rate is the lowest on record for the State — and while it is only one-tenth of a point below that of 1919 (rate of 13.9), this represents a saving of 1,045 lives for this year. The annual average death rate for 1913–1917 is 15.2. If this rate had prevailed in 1920 there would have been 14,631 more deaths.

The relative importance of the leading causes of death in 1920 was as follows:

Cause	Number of deaths	Rate per 100,000 population	Per cent of change of rate 1920 from 1913–17
Organic heart disease and endocarditis	22,657	216.8	+3.2
Pulmonary tuberculosis	11,030	105.5	—28.3
Cancer (all forms)	10,539	100.8	+7.6
Nephritis and Bright's disease	10,481	100.3	—18.9
Lobar pneumonia and unqualified	8,907	85.2	—17.4
Bronchopneumonia	7,568	72.4	+2.3
Accidents	7,351	70.3	—15.1
Congenital debility and malformations	7,115	68.1	—18.4
Cerebral hemorrhage and apoplexy	6,852	65.6	—0.2
Influenza	5,890	56.4	+259.2
Arteriosclerosis	4,883	46.7	+4.0
Diarrhea and enteritis (under 2 years)	4,662	44.6	—29.0
Diabetes	2,188	20.9	—0.9

Infant mortality. The number of deaths under 1 year of age in 1920, for the entire State, was 20,326, and the rate in proportion to each 1,000 live births was 86 as compared with 18,976 deaths in 1919 and a rate of 84. The number of deaths from diarrhea and enteritis under one year increased from 3,661 in 1919 to 3,947 in 1920; measles increased from 105 to 306; and whooping cough from 156 to 520.

Diarrhea and enteritis, (under 2 years), which is a very important cause of infant mortality, resulted in 4,662 deaths in 1920, corresponding to a mortality of 44.6 per 100,000 population. In 1919 it caused 4,191 deaths — a rate of 40.6. Of the 4,662 deaths in 1920, 3,947 were under one year of age; therefore, diarrhea and enteritis comprised 19.4 per cent of the total infant mortality of the State. Of the 3,947 deaths under 1 year of age,

2,174 occurred in New York City and 1,773 in the rest of the State. This death rate has been declining rapidly in recent years, as may be seen in the following data:

Year	Deaths	Rate per 100,000 population
1913-1917 (annual average)	6,154	62.8
1918	5,122	50.3
1919	4,191	40.6
1920	4,662	44.6

Congenital debility and malformations caused 7,115 deaths in 1920, represented by a rate of 68.1 per 100,000 population. Of the total 7,115 deaths, 7,047 occurred in the first year of life — which, therefore, comprised 34.7 per cent of the total infant mortality of the State. Of the 7,047 deaths under 1 year of age from these conditions, 3,584 occurred in New York City and 3,463 in the rest of the State. This mortality has also been declining in recent years:

Year	Deaths	Rate per 100,000 population
1913-1917 (annual average)	8,178	83.5
1918	7,995	78.5
1919	7,135	69.1
1920	7,115	68.1

Important Causes of Death

Typhoid fever. The number of deaths allocated to this disease in 1920 was 371, only 3 less than in 1919. The average annual number of deaths in 1913–1917 was 773 and the rate 7.9 per 100,000 population. Therefore, in 1920 the number of deaths was 402 below this five-year average, and the rate was 4.4 points less.

Measles. The deaths ascribed to measles in 1920 were 1,101 in number, corresponding to a mortality rate of 10.5 per 100,000 population. This is considerably higher than the rate for 1919 which was 3.4 with a total of 355 deaths. The average annual rate for 1913–17 was 9.4 with 917 deaths.

Scarlet fever caused 450 deaths this year, the mortality being 4.3 per 100,000 population,— an increase over 1919 of 182 in number and of 1.7 points in rate. As compared, however, with the 1913–17 average, the number of deaths decreased 25 and the rate 0.5.

Whooping cough in 1920 caused 1,007 deaths, the mortality being 9.6 per 100,000 population. The rate for 1919 was only 2.8 with 292 deaths and the 1913–17 average was 8.1 with 790 deaths.

Diphtheria caused 1,904 deaths this year, a mortality rate of 18.2 per 100,000 population. This is below the 1919 rate which was 19.9 with 2,055 deaths, and it is the same as the average annual rate for 1913–1917.

Cerebrospinal meningitis. The deaths classified to this heading during 1920, numbered 190, corresponding to a rate of 1.8 per 100,000 population. It shows a decrease over 1919 when the rate was 2.9 and the number of deaths 300.

Acute anterior poliomyelitis (infantile paralysis) was the cause of 50 deaths in 1920, corresponding to a mortality of 0.5 per 100,000 population. During the year 1916, when an epidemic of this disease occurred there were 3,351 deaths from this cause.

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	737	7.5
1918	57	0.6
1919	35	0.3
1920	50	0.5

Influenza caused 5,890 deaths this year corresponding to a mortality of 56.4 per 100,000 population. There were 2,157 fewer deaths this year than last even though there was a slight recurrence of the epidemic in February of this year. In comparing the rates with the 1913–17 average it can be seen that the rate has not yet returned to normal, viz.:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	1,534	15.7
1918	26,502	260.1
1919	8,047	78.0
1920	5,890	56.4

Pulmonary tuberculosis, including acute miliary, caused 11,030 deaths in the State this year,— a rate of 105.5 per 100,000 population. The number of deaths from this disease has decreased extraordinarily in the last two years. This can be seen from the following tabulation:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	14,412	147.1
1918	15,052	147.1
1919	12,814	124.2
1920	11,030	105.5

Since 1895 the mortality from this disease has been declining slowly — on the average of 2 points per year. The abrupt drop of 23.5 points in 1919 and then of 18.7 in 1920 is very remarkable, especially from a disease which causes about 14,000 deaths annually.

Tuberculous meningitis has also decreased from an average of 11.3 in 1913–1917 to 8.9 in 1919 and 7.8 in 1920.

The trend of all forms of tuberculosis is shown by the following:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	16,322	166.6
1918	16,973	166.6
1919	14,478	140.3
1920	12,543	120.0

Cancer (all forms combined) caused 10,539 deaths in 1920, corresponding to a rate of 100.8 per 100,000 population. This mortality rate has been increasing steadily:

Year	Deaths	Rate per 100,000 population
1913-1917 (annual average)	9,180	93.7
1918	9,876	96.9
1919	10,166	98.5
1920	10,539	100.8

Diabetes which caused 2,188 deaths in 1920, corresponding to a rate of 20.9 per 100,000 population, shows but little change during a period of years:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	2,067	21.1
1918	2,076	20.4
1919	1,972	19.1
1920	2,188	20.9

Cerebral hemorrhage and apoplexy (combined) caused 6,852 deaths in 1920, an increase of 214 deaths from this cause over 1919. The mortality has shown a slight upward trend since 1909. However, the rates for 1919 and 1920 are below the five-year average 1913–1917, viz.:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	6,436	65.7
1918	7,019	68.9
1919	6,638	64.3
1920	6,852	65.6

Organic heart disease and endocarditis (combined) caused more deaths in 1920 than any other cause of death, 22,657 in number, a rate of 216.8 per 100,000 population. There were 2,013 more deaths from this disease in 1920 than in 1919. This mortality rate showed a continuous increase from 1908 to 1918,— the average yearly increase being 7.5 points.

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	20,581	210.1
1918	23,456	230.2
1919	20,644	200.0
1920	22,657	216.8

Arteriosclerosis. In 1920 arteriosclerosis was the cause of 4,883 deaths, the rate per 100,000 population being 46.7. The mortality from this cause has shown a tendency to increase recently.

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	4,402	44.9
1918	4,616	45.3
1919	4,685	45.4
1920	4,883	46.7

Bronchitis (acute and chronic combined) which caused 1,759 deaths in 1920, has been decreasing of late years. However, there were 262 more deaths this year than in 1919:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	1,808	18.5
1918	1,839	18.0
1919	1,497	14.5
1920	1,759	16.8

Pneumonia. The total deaths assigned to pneumonia in its various forms numbered 16,475 in 1920, corresponding to a mortality of 157.6 per 100,000 population. The deaths from this cause have been increasing since 1914,

but have shown a falling off during the last two years. The deaths from bronchopneumonia, alone, in 1920 were 7,568 in number, an increase of 184 over 1919:

Year	Lobar Pneumonia and Unqualified		Broncho Pneumonia		All Forms Combined	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1913-1917 (annual average)	10,108	103.2	6,939	70.8	17,047	174.0
1918	23,949	235.0	10,564	103.7	34,513	338.7
1919	9,712	94.1	7,384	71.6	17,096	165.7
1920	8,907	85.2	7,568	72.4	16,475	157.6

Appendicitis caused 1,406 deaths in 1920, an increase of 175 deaths over 1919 and of 187 over the annual average for 1913–1917:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	1,219	12.4
1918	1,138	11.2
1919	1,231	11.9
1920	1,406	13.5

Hernia and intestinal obstruction. 1,214 deaths were reported in 1920, represented by a mortality of 11.6 per 100,000 population. This cause shows very little change from year to year, viz.:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	1,227	12.5
1918	1,317	12.9
1919	1,222	11.8
1920	1,214	11.6

Cirrhosis of the liver caused 779 deaths in 1920, a decrease of 63 over 1919. The number of deaths allocated to this title has been decreasing rapidly in recent years, viz.:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	1,438	14.7
1918	898	9.8
1919	842	8.2
1920	779	7.5

Nephritis and Bright's disease (acute and chronic Bright's disease) caused 10,481 deaths in 1920 and ranks fourth among the leading causes of death. This death rate varied but little during a long course of years; from 1900 to 1917 the rate fluctuated between 112.6 and 130.6. It declined sharply in 1918 and again in 1919.

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	12,113	123.7
1918	11,315	111.1
1919	10,540	102.1
1920	10,481	100.3

Puerperal causes. The number of deaths assigned to pregnancy or childbirth was 1,424 in 1920, an increase of 150 over 1919. This death rate has remained practically stationary for the last ten years:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	1,306	13.3
1918	1,563	15.3
1919	1,274	12.3
1920	1,424	13.6

Puerperal septicemia caused 384 or 27 per cent of the 1,424 deaths from all puerperal causes. This death rate has shown a tendency to decrease within the last ten years, but there were 32 more deaths from this cause in 1920 than in 1919:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	470	4.8
1918	410	4.0
1919	352	3.4
1920	384	3.7

Old age, to which 838 deaths were allocated in 1920, showed a rate of 8.0 per 100,000 population. This title may be regarded as an index of the accuracy of statements as to the cause of death of aged people, and as such it indicates constant improvement in certification during recent years, viz.:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	1,208	12.3
1918	826	8.1
1919	873	8.5
1920	838	8.0

Accidents (all external causes except suicide and homicide) resulted in 7,351 deaths in 1920, the rate per 100,000 population being 70.3. During recent years a decline in this rate can be noticed, viz.:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	8,112	82.8
1918	8,448	82.9
1919	7,433	72.0
1920	7,351	70.3

Automobile accidents, which caused 1,439 deaths in 1920 are steadily increasing in importance relative to other causes of deaths, viz.:

Year	Deaths	Rate per 100,000 population
1914–1917 (annual average)	608	6.2
1918	1,216	11.9
1919	1,361	13.2
1920	1,439	13.8

Accidental drowning has shown a tendency to decline within the last few years:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	1,042	10.6
1918	909	8.9
1919	869	8.4
1920	726	6.9

Suicide has declined continuously in recent years:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	1,521	15.5
1918	1,302	12.8
1919	1,294	12.5
1920	1,189	11.4

Homicide resulted in 448 deaths in 1920, 18 more than 1919. With slight variations this rate has been fairly stationary during recent years:

Year	Deaths	Rate per 100,000 population
1913–1917 (annual average)	425	4.3
1918	385	3.8
1919	430	4.2
1920	448	4.3

MOVEMENT OF NATALITY, AND OF MORTALITY BY CERTAIN AGES AND FROM IMPORTANT CAUSES IN NEW YORK STATE: 1920 COMPARED WITH 1919 AND WITH THE AVERAGE FOR THE QUINQUENNIUM 1913-1917

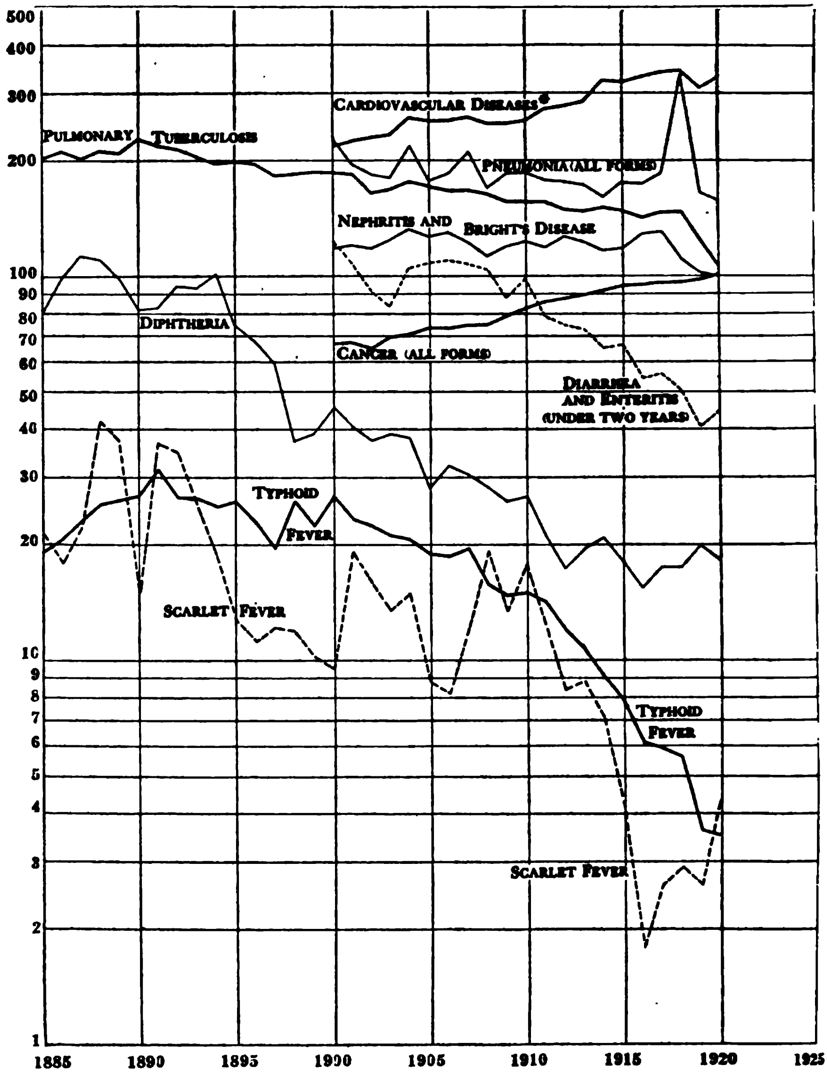
International list numbers (revision of 1909)	AGE OR CAUSE OF DEATH	1920		1919		1913-1917 (ANNUAL AVERAGE)		INCREASE OR DECREASE 1920 FROM 1913-17		PER CENT OF CHANGE OF RATE 1920 FROM 1913-17	
		Number	Rate†	Number	Rate†	Number	Rate†	Number	Rate†	Increase	Decrease
	Estimated population*	10,450,716	.....	10,319,736	.....	9,795,810	.....	654,906	......	.....	....
	Total births (stillbirths excluded)	235,460	22.5	226,269	21.9	239,794	24.5	—4,334	—2.0	.....	8.2
	Total deaths, all causes (stillbirths excluded)	144,466	13.8	143,401	13.9	148,662	15.2	—4,196	—1.4	.....	9.2
	Under 5 years	29,584	283.1	27,048	262.1	33,462	341.6	—3,878	—58.5	.....	17.1
	Under 1 year	20,326	86.0	18,976	84.0	23,612	98.0	—3,286	—12.0	.....	12.2
	1-4 years	9,258	88.6	8,072	78.2	9,850	100.6	—592	—12.0	.....	11.9
	5-64 years	72,804	696.6	76,880	745.0	....	.....	......	......	.....	....
	65 years and over	42,009	402.0	39,410	381.9	....	.....	......	......	.....	....
	Unknown ages	69	0.7	63	0.6	....	.....	......	......	.....	....
1	Typhoid fever	371	3.5	374	3.6	773	7.9	—402	—4.4	.....	55.7
6	Measles	1,101	10.5	355	3.4	917	9.4	+184	+1.1	11.7	....
7	Scarlet fever	450	4.3	268	2.6	475	4.8	—25	—0.5	.....	10.4
8	Whooping cough	1,007	9.6	292	2.8	790	8.1	+217	+1.5	18.5	....
9	Diphtheria	1,904	18.2	2,055	19.9	1,783	18.2	+121	0.0	.....	....
61b, c	Cerebrospinal meningitis	190	1.8	300	2.9	307	3.1	—117	—1.3	.....	41.9
63a	Acute anterior poliomyelitis	50	0.5	35	0.3	737	7.5	—687	—7.0	.....	93.3
10	Influenza	5,890	56.4	8,047	78.0	1,534	15.7	+4,356	+40.7	259.2	....
28-35	Tuberculosis (all forms)	12,543	120.0	14,478	140.3	16,322	166.6	—3,779	—46.6	.....	28.0
28, 29	Pulmonary tuberculosis	11,030	105.5	12,814	124.2	14,412	147.1	—3,382	—41.6	.....	28.3
30	Tuberculous meningitis	814	7.8	915	8.9	1,108	11.3	—294	—3.5	.....	31.0
31-35	Other forms	699	6.7	749	7.3	802	8.2	—103	—1.5	.....	18.3
39-45	Cancer (all forms)	10,539	100.8	10,166	98.5	9,180	93.7	+1,359	+7.1	7.6	....
50	Diabetes	2,188	20.9	1,972	19.1	2,067	21.1	+121	—0.2	.....	0.9
64	Cerebral hemorrhage, apoplexy	6,852	65.6	6,638	64.3	6,436	65.7	+416	—0.1	.....	0.2
78, 79	Organic heart disease and endocarditis	22,657	216.8	20,644	200.0	20,581	210.1	+2,076	+6.7	3.2	....
81	Arteriosclerosis	4,883	46.7	4,685	45.4	4,402	44.9	+481	+1.8	4.0	....
89, 90	Bronchitis	1,759	16.8	1,497	14.5	1,808	18.5	—49	—1.7	.....	9.2
91, 92	Pneumonia	16,475	157.6	17.096	165.7	17.047	174.0	—572	—16.4	.....	9.4
91	Bronchopneumonia	7,568	72.4	7,384	71.6	6,939	70.8	+629	+1.6	2.3	....
92	Lobar pneumonia and unqualified	8,907	85.2	9,712	94.1	10,108	103.2	—1,201	—18.0	.....	17.4
104	Diarrhea and enteritis (under 2 years)	4,662	44.6	4,191	40.6	6,154	62.8	—1,492	—18.2	.....	29.0
108	Appendicitis	1,406	13.5	1,231	11.9	1,219	12.4	+187	+1.1	8.9	....
109	Hernia, intestinal obstruction	1,214	11.6	1,222	11.8	1,227	12.5	—13	—0.9	.....	7.2
113	Cirrhosis of liver	779	7.5	842	8.2	1,438	14.7	—659	—7.2	.....	49.0
119-120	Nephritis and Bright's disease	10,481	100.3	10,540	102.1	12,113	123.7	—1,632	—23.4	.....	18.9
134-141	Diseases of the puerperal state	1,424	13.6	1,274	12.3	1,306	13.3	+118	+0.3	2.3	....
137	Puerperal septicemia	384	3.7	352	3.4	470	4.8	—86	—1.1	.....	22.9
150, 151	Congenital debility and malformations	7,115	68.1	7,135	69.1	8,178	83.5	—1,063	—15.4	.....	18.4
154	Old age	838	8.0	873	8.5	1,208	12.3	—370	—4.3	.....	35.0
164-181, 185, 186	Accidents	7,351	70.3	7,433	72.0	8,112	82.8	—761	—12.5	.....	15.1
175c	Automobile accidents	1,439	13.8	1,361	13.2	§608	6.2	+831	+7.6	122.6	....
169	Drowning	726	6.9	869	8.4	1,042	10.6	—316	—3.7	.....	34.9
155-163	Suicides	1,189	11.4	1,294	12.5	1,521	15.5	—332	—4.1	.....	26.5
182-184	Homicides	448	4.3	430	4.2	425	4.3	+23	0.0	.....	....
	All other causes	18,700	178.9	18,034	174.8	20,602	210.3	—1,902	—31.4	.....	14.9

* Population estimated on the basis of the increase between the U. S. Censuses of 1910 and 1920, computed by the arithmetic method.

† Total births and deaths per 1,000 population; deaths under 1 year per 1,000 living births (infant mortality rate); deaths for all other ages and by causes per 100,000 population.

§ Four year average.

MOVEMENT OF DEATH RATES PER 100,000 POPULATION FROM IMPORTANT CAUSES, ENTIRE STATE OF NEW YORK



* This title includes Cerebral Hemorrhage, Apoplexy, Organic Heart Disease, Endocarditis, and Arteriosclerosis.

STATISTICAL TABLES

PRESENTING AND ANALYZING THE RESULTS OF REGISTRATION OF BIRTHS, DEATHS AND MARRIAGES IN THE STATE OF NEW YORK AND ITS SUBDIVISIONS DURING THE YEAR 1920, WITH COMPARATIVE DATA FOR PREVIOUS YEARS*

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* Prior to 1914 the original certificates of births and deaths were not filed with the State Department of Health from the cities of New York, Albany, Buffalo and Yonkers, the data for those cities included in the reports of the State Department being based upon the compilations prepared monthly by the respective local registrars of these cities.

Beginning January 1, 1914, the State Department of Health has been receiving the original certificates of births and deaths from all cities, towns and villages in the State, excepting only New York City. Unless otherwise indicated, therefore, the compilations presented in the monthly bulletins and annual reports of the Department since 1914 are based upon the data given on the original certificates, except for New York City, the figures for which are supplied monthly by the Registrar of Records of the New York City Department of Health.

Table 1 — NEW YORK STATE: *Annual number of births, deaths, and marriages, with rates per 1,000 population:* **1885–1920**

YEAR	Population*	Births (stillbirths excluded)	Deaths (stillbirths excluded)	Marriages	RATES		
					Births	Deaths	Persons marrying
1885	5,550,690	63,536	80,407	24,409	11.4	14.5	8.8
1886	5,642,720	89,828	86,801	36,764	15.9	15.4	13.0
1887	5,734,751	102,038	108,269	44,438	17.8	18.9	15.5
1888	5,826,782	103,089	114,584	43,683	17.7	19.7	15.0
1889	5,918,813	114,804	113,155	50,960	19.4	19.1	17.2
1890	6,013,722	112,572	128,648	41,195	18.7	21.4	13.7
1891	6,140,294	125,909	129,850	51,458	20.5	21.1	16.8
1892	6,266,866	130,143	131,388	52,725	20.8	21.0	16.8
1893	6,393,438	136,297	129,659	52,805	21.3	20.3	16.5
1894	6,520,010	141,827	123,423	52,539	21.8	18.9	16.1
1895	6,646,582	142,311	128,834	59,059	21.4	19.4	17.8
1896	6,773,154	147,327	126,253	58,990	21.8	18.6	17.4
1897	6,899,726	144,631	118,525	57,530	21.0	17.2	16.7
1898	7,026,298	138,702	122,584	57,392	19.7	17.4	16.3
1899	7,152,870	136,778	121,831	61,167	19.1	17.0	17.1
1900	7,284,461	143,156	132,089	63,225	19.7	18.1	17.4
1901	7,471,268	140,539	131,635	65,216	18.8	17.6	17.5
1902	7,658,075	146,740	124,830	68,903	19.2	16.3	18.0
1903	7,844,882	158,343	127,498	73,011	20.2	16.3	18.6
1904	8,031,689	165,014	142,217	74,677	20.5	17.7	18.6
1905	8,218,496	172,259	137,435	78,261	21.0	16.7	19.0
1906	8,405,303	183,012	141,099	87,870	21.8	16.8	20.9
1907	8,592,110	196,020	147,130	92,421	22.8	17.1	21.5
1908	8,778,917	203,159	138,912	73,644	23.1	15.8	16.8
1909	8,965,724	202,656	140,261	80,090	22.6	15.6	17.9
1910	9,140,902	213,235	147,710	85,490	23.3	16.2	18.7
1911	9,271,883	221,678	145,912	86,463	23.9	15.7	18.7
1912	9,402,865	227,120	142,377	97,427	24.2	15.1	20.7
1913	9,533,847	228,713	145,274	92,343	24.0	15.2	19.4
1914	9,664,828	240,038	145,476	93,793	24.8	15.1	19.4
1915	9,795,810	242,950	146,892	91,102	24.8	15.0	18.6
1916	9,926,791	240,817	151,543	97,474	24.3	15.3	19.6
1917	10,057,773	246,453	154,127	104,800	24.5	15.3	20.8
1918	10,188,755	242,704	192,318†	94,107	23.8	18.9	18.5
1919	10,319,736	226,269	143,401	103,715	21.9	13.9	20.1
1920	10,450,716	235,460	144,466	111,280	22.5	13.8	21.3

* Rates are based upon populations uniformly estimated as of July 1 of each year and supplied to 1910 by the United States Bureau of the Census.

In the above and following tables populations from 1910 to 1920 inclusive have been revised by this Division upon the basis of the Federal Census enumerations of 1910 and 1920.

Rates from 1910 through 1920 have been computed on the respective revised estimated population for these years.

† Civilian deaths only, except for New York city.

Table 2 — NEW YORK CITY and REST OF STATE: *Annual number of deaths with death rates per* 1,000 *population:* 1898–1920

Year	New York City†			Rest of State		
	Population*	Deaths (still-births excluded)	Rate‡	Population*	Deaths (still-births excluded)	Rate‡
1898	3,256,149	66,330	20.4	3,770,149	56,254	14.9
1899	3,350,611	65,347	19.5	3,802,259	56,484	14.9
1900	3,448,423	70,870	20.6	3,836,028	61,219	16.0
1901	3,583,074	70,722	19.7	3,888,194	60,613	15.6
1902	3,717,725	68,131	18.3	3,940,350	56,699	14.4
1903	3,852,376	67,808	17.6	3,992,506	59,690	15.0
1904	3,987,027	78,043	19.6	4,044,662	64,174	15.9
1905	4,121,678	73,714	17.9	4,096,818	63,721	15.6
1906	4,256,329	76,203	17.9	4,148,974	64,896	15.6
1907	4,390,980	79,205	18.0	4,201,130	67,925	16.2
1908	4,525,631	73,075	16.1	4,253,286	65,837	15.5
1909	4,660,283	74,105	15.9	4,305,441	66,156	15.4
1910	4,785,191	76,750	16.0	4,355,711	70,960	16.3
1911	4,873,071	75,423	15.5	4,398,812	70,489	16.0
1912	4,960,951	73,019	14.7	4,441,914	69,358	15.6
1913	5,048,830	73,903	14.6	4,485,017	71,371	15.9
1914	5,136,710	74,803	14.6	4,528,118	70,673	15.6
1915	5,224,590	76,193	14.6	4,571,220	70,699	15.5
1916	5,312,469	77,800	14.6	4,614,322	73,743	16.0
1917	5,400,349	78,575	14.5	4,657,424	75,552	16.2
1918	5,488,228	98,119	17.9	4,700,527	§94,199	20.0
1919	5,576,108	74,433	13.3	4,743,628	68,968	14.5
1920	5,663,988	73,249	12.9	4,786,728	71,217	14.9

* Rates are based upon populations uniformly estimated as of July 1 of each year and supplied to 1910 by the United States Bureau of the Census.

In the above and following tables populations from 1910 to 1920 inclusive have been revised by this Division upon the basis of the Federal Census enumerations of 1910 and 1920.

Rates from 1910 through 1920 have been computed on the respective revised estimated populations for these years.

† Previous to 1910, the local figures for New York City differ somewhat from the State figures here given, but the divergences in rate are slight.

‡ Crude rates, taking no account of the more favorable age constitution of New York City. For standardized rates, see discussion of this subject in report for 1915, pages 312–316, 552–561 and accompanying charts.

§ Civilian deaths only.

Table 3 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Deaths by sex color, marital condition and general nativity:* 1920

SEX, COLOR, MARITAL CONDITION, GENERAL NATIVITY	NEW YORK STATE	New York City	Rest of State
Total deaths	144,466	73,249	71,217
Sex:			
Male	74,728	38,270	36,458
Female	69,738	34,979	34,759
Color or race:			
White	140,025	69,870	70,155
Negro	4,184	3,214	970
Chinese	148	131	17
Japanese	34	34	....
Indian	75	....	75
Marital condition:			
Single	56,975	31,970	25,005
Married	54,636	26,647	27,989
Widowed and divorced	32,138	14,169	17,969
Unknown	717	463	254
General nativity:			
Native	98,177	43,122	55,055
Foreign-born	44,884	29,191	15,693
Unknown	1,405	936	469

Table 4 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Number and percentage of deaths at each age period:* 1920

AGES AT DEATH	NEW YORK STATE		NEW YORK CITY		REST OF STATE	
	Deaths	Per cent	Deaths	Per cent	Deaths	Per cent
Total deaths — all ages	144,466	100.0	73,249	100.0	71,217	100.0
Under 1 year	20,326	14.1	11,340	15.5	8,986	12.6
1	4,798	3.3	3,205	4.4	1,593	2.2
2	2,100	1.5	1,349	1.8	751	1.1
3	1,333	0.9	777	1.1	556	0.8
4	1,027	0.7	617	0.8	410	0.6
Total under 5 years	29,584	20.5	17,288	23.6	12,296	17.3
5–9	3,144	2.2	1,831	2.5	1,313	1.8
10–14	2,038	1.4	1,115	1.5	923	1.3
15–19	2,973	2.1	1,645	2.2	1,328	1.9
20–24	4,706	3.3	2,763	3.8	1,943	2.7
25–29	5,897	4.1	3,421	4.7	2,476	3.5
30–34	6,091	4.2	3,423	4.7	2,668	3.7
35–39	6,336	4.4	3,668	5.0	2,668	3.7
40–44	6,268	4.3	3,608	4.9	2,660	3.7
45–49	7,240	5.0	4,212	5.8	3,028	4.3
50–54	8,525	5.9	4,833	6.6	3,692	5.2
55–59	9,147	6.3	4,920	6.7	4,227	5.9
60–64	10,439	7.2	5,182	7.1	5,257	7.4
65–69	10,672	7.4	4,740	6.5	5,932	8.3
70–74	10,422	7.2	4,166	5.7	6,256	8.8
75–79	9,356	6.5	3,151	4.3	6,205	8.7
80–84	6,482	4.5	1,950	2.6	4,532	6.4
85 years and over	5,077	3.5	1,333	1.8	3,744	5.3
Unknown	69	....	....	....	69	0.1

Table 5 — NEW YORK STATE (exclusive of New York City) — *Deaths by*

SEX, RACE, GENERAL NATIVITY, AND MARITAL CONDITIONS	ALL AGES	AGES AT										
		Under 1 year	1+	2+	3+	4+	Total under 5 years	5-9	10-14	15-19	20-24	25-29
TOTAL DEATHS (excl. of stillbirths).......	71,217	8,986	1,593	751	556	410	12,296	1,313	923	1,328	1,943	2,476
Male..............	36,458	5,164	879	394	276	207	6,920	709	513	702	916	1,214
Female............	34,759	3,822	714	357	280	203	5,376	604	410	626	1,027	1,262
Race												
White............	70,155	8,848	1,552	729	548	409	12,086	1,292	906	1,288	1,880	2,406
Male............	35,899	5,090	863	382	272	206	6,813	697	502	688	879	1,178
Female..........	34,256	3,758	689	347	276	203	5,273	595	404	600	[1,001	1,228
Negro............	970	132	35	17	6	1	191	19	15	32	56	63
Male............	509	72	14	9	3	1	99	11	10	9	35	29
Female..........	461	60	21	8	3	.....	92	8	5	23	21	34
Indian...........	75	6	5	5	2	.....	18	2	2	8	6	2
Male............	33	2	1	3	1	.....	7	1	1	5	1	2
Female..........	42	4	4	2	1	.....	11	1	1	3	5	.....
Chinese, Japanese and other colored........	17	.....	1	.....	.....	.....	1	.....	.....	.....	1	5
Male............	17	.....	1	.....	.....	.....	1	.....	.....	.....	1	5
Female..........	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nativity												
Native...........	55,055	8,961	1,585	745	551	404	12,246	1,277	871	1,208	1,659	1,901
Male............	28,025	5,152	875	391	273	203	6,894	693	487	637	777	889
Female..........	27,030	3,809	710	354	278	201	5,352	584	384	571	882	1,012
Foreign-born....	15,693	18	8	5	4	6	41	34	52	112	274	560
Male............	8,113	10	4	3	2	4	23	15	26	59	129	312
Female..........	7,580	8	4	2	2	2	18	19	26	53	145	248
Unknown........	469	7	.....	1	1	.....	9	2	.....	8	10	15
Male............	320	2	.....	.....	1	.....	3	1	.....	6	10	13
Female..........	149	5	.....	1	.....	.....	6	1	.....	2	.....	2
Marital condition												
Single...........	25,005	8,986	1,593	751	556	410	12,296	1,313	923	1,217	1,230	990
Male............	14,161	5,164	879	394	276	207	6,920	709	513	693	741	676
Female..........	10,844	3,822	714	357	280	203	5,376	604	410	524	489	314
Married.........	27,989	.....	.....	.....	.....	.....	.....	.....	.....	108	691	1,430
Male............	15,819	.....	.....	.....	.....	.....	.....	.....	.....	9	166	513
Female..........	12,170	.....	.....	.....	.....	.....	.....	.....	.....	99	525	917
Widowed........	17,629	.....	.....	.....	.....	.....	.....	.....	.....	2	8	34
Male............	6,065	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	13
Female..........	11,564	.....	.....	.....	.....	.....	.....	.....	.....	2	6	21
Divorced.........	340	.....	.....	.....	.....	.....	.....	.....	.....	1	9	13
Male............	194	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	4
Female..........	146	.....	.....	.....	.....	.....	.....	.....	.....	1	7	9
Unknown........	254	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	9
Male............	219	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	8
Female..........	35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1

age groups, sex, race, general nativity, and marital condition: **1920**

DEATH

30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85–89	90–94	95–99	100+	Unknown
2,668	**2,668**	**2,660**	**3,028**	**3,692**	**4,227**	**5,257**	**5,932**	**6,256**	**6,205**	**4,532**	**2,657**	**879**	**183**	**25**	**69**
1,342	1,456	1,490	1,602	1,906	2,191	2,744	3,063	3,075	2,988	2,062	1,109	354	60	9	33
1,326	1,212	1,170	1,426	1,786	2,036	2,513	2,869	3,181	3,212	2,470	1,548	525	123	16	36
2,604	**2,590**	**2,613**	**2,963**	**3,631**	**4,175**	**5,197**	**5,882**	**6,186**	**6,158**	**4,507**	**2,649**	**874**	**180**	**22**	**66**
1,317	1,416	1,457	1,566	1,871	2,170	2,714	3,032	3,042	2,959	2,044	1,106	351	59	7	31
1,287	1,174	1,156	1,397	1,760	2,005	2,483	2,850	3,144	3,199	2,463	1,543	523	121	15	35
60	**76**	**44**	**60**	**59**	**47**	**52**	**48**	**67**	**37**	**23**	**8**	**5**	**2**	**3**	**3**
23	38	31	34	33	19	25	31	32	23	17	3	3	.....	2	2
37	38	13	26	26	28	27	17	35	14	6	5	2	2	1	1
3	**1**	**2**	**4**	**1**	**4**	**5**	**2**	**3**	**9**	**2**	.....	.....	**1**	.....	.....
1	1	1	1	1	1	2	.....	1	5	1	.....	.....	1	.....	.....
2	.....	1	3	.....	3	3	2	2	4	1	.....	.....	.....	.....	.....
1	**1**	**1**	**1**	**1**	**1**	**3**	.....	.....	**1**	.....	.....	.....	.....	.....	.....
1	1	1	1	1	1	3	.....	.....	1	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,963	**1,915**	**1,902**	**2,146**	**2,581**	**2,985**	**3,810**	**4,538**	**4,277**	**4,263**	**3,135**	**1,836**	**580**	**118**	**17**	**27**
943	1,003	1,031	1,066	1,285	1,510	1,944	2,268	2,101	2,065	1,410	747	222	37	7	9
1,020	912	871	1,080	1,296	1,475	1,866	2,070	2,176	2,198	1,725	1,089	358	81	10	18
694	**732**	**726**	**848**	**1,077**	**1,309**	**1,393**	**1,560**	**1,931**	**1,898**	**1,363**	**805**	**297**	**64**	**7**	**16**
389	438	437	512	600	658	754	770	950	896	634	352	131	23	2	3
305	294	289	336	477	551	639	790	981	1,002	729	453	166	41	5	13
11	**21**	**32**	**34**	**34**	**33**	**54**	**34**	**48**	**44**	**34**	**16**	**2**	**1**	**1**	**26**
10	15	22	24	21	23	46	25	24	27	18	10	1	.....	.....	21
1	6	10	10	13	10	8	9	24	17	16	6	1	1	1	5
749	**618**	**602**	**566**	**655**	**600**	**720**	**645**	**660**	**561**	**375**	**201**	**50**	**11**	**1**	**22**
513	427	405	350	359	339	367	346	321	234	144	75	14	2	.....	13
236	191	197	216	296	261	353	299	339	327	231	126	36	9	1	9
1,809	**1,901**	**1,840**	**2,139**	**2,469**	**2,768**	**3,148**	**3,176**	**2,692**	**2,131**	**1,123**	**237**	**102**	**13**	**1**	**11**
774	960	973	1,111	1,313	1,560	1,848	1,989	1,764	1,543	843	352	88	10	1	2
1,035	941	867	1,028	1,156	1,208	1,300	1,187	928	588	280	85	14	3	.....	9
77	**99**	**163**	**273**	**518**	**804**	**1,320**	**2,045**	**2,856**	**3,482**	**3,017**	**2,008**	**723**	**159**	**21**	**20**
27	40	72	104	202	258	471	685	956	1,187	1,061	678	250	48	7	4
50	59	91	169	316	546	849	1,360	1,900	2,295	1,956	1,330	473	111	14	16
20	**37**	**37**	**24**	**30**	**39**	**33**	**43**	**28**	**14**	**7**	**3**	**2**	.....	.....	.....
15	16	24	13	15	21	24	23	17	13	5	1	1	.....	.....	.....
5	21	13	11	15	18	9	20	11	1	2	2	1	.....	.....	.....
13	**13**	**18**	**26**	**20**	**16**	**36**	**23**	**20**	**17**	**10**	**8**	**2**	.....	**2**	**16**
13	13	16	24	17	13	34	20	17	11	9	3	1	.....	1	14
.....	.....	2	2	3	3	2	3	3	6	1	5	1	.....	1	2

Table 6 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Births, stillbirths, and deaths, with birth, death, and infant mortality rates by months; also deaths by broad age groups and important causes, by months:* 1920

MONTH	Births (stillbirths excluded)	Stillbirths	Deaths (stillbirths excluded)	RATES		
				Birth	Death	Infant mortality
New York State	**235,460**	**10,182**	**144,466**	**22.5**	**13.8**	**86**
New York City	**132,856**	**6,232**	**73,249**	**23.5**	**12.9**	**85**
Rest of State	**102,604**	**3,950**	**71,217**	**21.4**	**14.9**	**88**
January, total	20,070	905	14,736	22.7	16.6	89
New York City	11,280	538	8,330	23.5	17.4	93
Rest of State	8,790	367	6,406	21.7	15.8	83
February, total	20,011	971	21,426	24.1	25.8	127
New York City	11,255	557	11,523	25.0	25.6	137
Rest of State	8,756	414	9,903	23.0	26.1	115
March, total	21,195	862	14,051	23.9	15.9	94
New York City	12,147	537	7,128	25.3	14.8	97
Rest of State	9,048	325	6,923	22.3	17.1	91
April, total	19,712	833	12,320	23.0	14.4	90
New York City	11,206	501	6,321	24.1	13.6	87
Rest of State	8,506	332	5,999	21.7	15.3	94
May, total	19,261	873	11,952	21.7	13.5	88
New York City	10,364	525	5,798	21.6	12.1	86
Rest of State	8,897	348	6,154	21.9	15.2	90
June, total	20,374	791	9,966	23.8	11.6	68
New York City	11,810	499	4,863	25.4	10.5	65
Rest of State	8,564	292	5,103	21.8	13.0	72
July, total	20,645	827	9,383	23.3	10.6	67
New York City	11,616	509	4,566	24.2	9.5	71
Rest of State	9,029	318	4,817	22.3	11.9	63
August, total	20,263	781	9,900	22.9	11.2	89
New York City	11,150	469	4,830	23.2	10.1	92
Rest of State	9,113	312	5,070	22.5	12.5	86
September, total	19,530	807	9,647	22.8	11.3	86
New York City	10,869	520	4,640	23.4	10.0	76
Rest of State	8,661	287	5,007	22.1	12.8	97
October, total	18,391	803	9,850	20.8	11.1	85
New York City	10,350	485	4,646	21.6	9.7	74
Rest of State	8,041	318	5,204	19.8	12.8	98
November, total	17,272	835	10,000	20.2	11.7	73
New York City	9,932	508	5,045	21.4	10.9	70
Rest of State	7,340	327	4,955	18.7	12.6	76
December, total	18,736	894	11,235	21.2	12.7	79
New York City	10,877	584	5,559	22.7	11.6	74
Rest of State	7,859	310	5,676	19.4	14.0	85

Table 6 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Births, stillbirths, and deaths, with birth, death, and infant mortality rates by months; also deaths by broad age groups and important causes, by months:* 1920 — (Continued)

MONTH	AGES AT DEATH										
	Under 1	1–4	5–9	10–14	15–19	20–29	30–39	40–49	50–59	60 and over	Unknown
New York State....	20,326	9,258	3,144	2,038	2,973	10,603	12,427	13,508	17,672	52,448	69
New York City...	11,340	5,948	1,831	1,115	1,645	6,184	7,091	7,820	9,753	20,522	....
Rest of State.....	8,986	3,310	1,313	923	1,328	4,419	5,336	5,688	7,919	31,926	69
January, total......	1,779	917	292	193	334	1,277	1,366	1,308	1,840	5,423	7
New York City...	1,048	659	167	114	216	903	917	834	1,125	2,347	....
Rest of State.....	731	258	125	79	118	374	449	474	715	3,076	7
February, total.....	2,546	1,818	403	248	484	2,453	2,683	1,948	2,254	6,577	12
New York City...	1,540	1,286	241	128	269	1,437	1,473	1,126	1,226	2,797	....
Rest of State.....	1,006	532	162	120	215	1,016	1,210	822	1,028	3,780	12
March, total........	1,998	1,067	283	169	271	960	1,111	1,331	1,634	5,221	6
New York City...	1,174	700	172	91	150	534	612	758	890	2,047	....
Rest of State.....	824	367	111	78	121	426	499	573	744	3,174	6
April, total.........	1,768	861	250	172	241	707	941	1,174	1,597	4,600	9
New York City...	972	582	150	102	143	438	542	679	904	1,809	....
Rest of State.....	796	279	100	70	98	269	399	495	693	2,791	9
May, total.........	1,693	761	292	182	218	748	934	1,098	1,443	4,577	6
New York City...	892	500	180	95	122	423	531	594	762	1,699	....
Rest of State.....	801	261	112	87	96	325	403	504	681	2,878	6
June, total.........	1,378	550	274	171	225	695	804	974	1,269	3,623	3
New York City...	764	327	171	104	115	360	442	577	687	1,316	....
Rest of State.....	614	223	103	67	110	335	362	397	582	2,307	3
July, total.........	1,389	495	233	172	238	642	739	894	1,203	3,371	7
New York City...	821	309	139	88	117	345	400	522	651	1,174	....
Rest of State.....	568	186	94	84	121	297	339	372	552	2,197	7
August, total.......	1,813	593	208	152	235	712	725	894	1,213	3,351	4
New York City...	1,025	357	106	76	116	375	398	514	655	1,208	....
Rest of State.....	788	236	102	76	119	337	327	380	558	2,143	4
September, total....	1,675	551	189	140	200	595	743	881	1,138	3,530	5
New York City...	831	303	115	74	113	345	434	477	590	1,358	....
Rest of State.....	844	248	74	66	87	250	309	404	548	2,172	5
October, total......	1,555	479	241	128	184	596	775	906	1,231	3,752	3
New York City...	769	265	122	72	98	329	395	506	669	1,421	....
Rest of State.....	786	214	119	56	86	267	380	400	562	2,331	3
November, total....	1,259	529	235	155	165	564	738	995	1,340	4,019	1
New York City...	700	309	131	88	90	328	447	587	764	1,601	....
Rest of State.....	559	220	104	67	75	236	291	408	576	2,418	1
December, total....	1,473	637	244	156	178	654	868	1,105	1,510	4,404	6
New York City...	804	351	137	83	96	367	500	646	830	1,745	....
Rest of State.....	669	286	107	73	82	287	368	459	680	2,659	6

Table 6 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Births, still-births, and deaths with birth, death, and infant mortality rates by months; also deaths, by broad age groups and important causes, by months:* 1920 — (Continued)

MONTH	Total deaths (still-births excluded)	CAUSES OF DEATH										
		GENERAL DISEASES										
									Tuberculosis			
		Typhoid fever, 1	Smallpox, 5	Measles, 6	Scarlet fever, 7	Whooping cough, 8	Diphtheria, 9	Influenza, 10	Total (all forms), 28–35	Pulmonary, 28, 29	Tuberculous meningitis, 30	Other forms, 31–35
New York State	144,466	371	1	1,101	450	1,007	1,904	5,890	12,543	11,030	814	699
New York City	73,249	137	....	736	220	615	1,045	3,492	7,135	6,269	509	357
Rest of State	71,217	234	1	365	230	392	859	2,398	5,408	4,761	305	342
January, total	14,736	17	....	132	38	61	237	905	1,130	995	83	52
New York City	8,330	7	....	111	12	42	136	711	679	604	53	22
Rest of State	6,406	10	....	21	26	19	101	194	451	391	30	30
February, total	21,426	12	....	225	52	149	249	3,700	1,381	1,230	84	67
New York City	11,523	4	....	185	21	98	149	2,220	778	701	49	28
Rest of State	9,903	8	....	40	31	51	100	1,480	603	529	35	39
March, total	14,051	13	....	161	31	114	227	649	1,264	1,112	73	79
New York City	7,128	7	....	125	15	74	136	256	749	665	43	41
Rest of State	6,923	6	....	36	16	40	91	393	515	447	30	38
April, total	12,320	30	....	183	34	84	170	202	1,194	1,057	81	56
New York City	6,321	5	....	136	19	50	113	94	678	592	52	34
Rest of State	5,999	25	....	47	15	34	57	108	516	465	29	22
May, total	11,952	16	....	136	41	74	136	122	1,204	1,057	83	64
New York City	5,798	5	....	90	26	50	81	62	664	576	54	34
Rest of State	6,154	11	....	46	15	24	55	60	540	481	29	30
June, total	9,966	20	....	80	35	79	127	48	1,042	904	76	62
New York City	4,863	1	....	45	16	44	79	24	572	494	50	28
Rest of State	5,103	19	....	35	19	35	48	24	470	410	26	34
July, total	9,383	42	....	46	24	91	74	26	956	843	62	51
New York City	4,566	15	....	14	11	55	41	17	550	478	49	23
Rest of State	4,817	27	....	32	13	36	33	9	406	365	13	28
August, total	9,900	49	....	23	19	105	74	32	927	801	58	68
New York City	4,830	25	....	6	11	65	35	16	519	447	37	35
Rest of State	5,070	24	....	17	8	40	39	16	408	354	21	33
September, total	9,647	64	....	12	23	101	66	31	842	745	51	46
New York City	4,640	31	....	4	10	69	29	15	471	418	25	28
Rest of State	5,007	33	....	8	13	32	37	16	371	327	26	18
October, total	9,850	51	....	20	29	53	136	38	829	727	51	51
New York City	4,646	15	....	5	14	32	44	18	474	408	37	29
Rest of State	5,204	36	....	15	15	21	92	20	355	319	14	22
November, total	10,000	24	....	31	38	34	179	47	852	757	54	41
New York City	5,045	10	....	3	14	19	86	22	491	440	33	18
Rest of State	4,955	14	....	28	24	15	93	25	361	317	21	23
December, total	11,235	33	1	52	86	62	229	90	922	802	58	62
New York City	5,559	12	....	12	51	17	116	37	510	446	27	37
Rest of State	5,676	21	1	40	35	45	113	53	412	356	31	25

Table 6 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: ***Births, still-births, and deaths, with birth, death, and infant mortality rates by months; also deaths by broad age groups and important causes, by months:*** **1920 — (Continued)**

MONTH	CAUSES OF DEATH — (*Continued*)										
			DISEASES OF THE NERVOUS SYSTEM			DISEASES OF THE CIRCULATORY SYSTEM		DISEASES OF THE RESPIRATORY SYSTEM			
									Pneumonia		
	Cancer, 39–45	Diabetes, 50	Cerebrospinal meningitis, 61 b, c	Acute anterior poliomyelitis, 63a	Apoplexy and cerebral hemorrhage, 64	Organic heart disease, 79	Arteriosclerosis, 81	Bronchitis, 89, 90	Total (all forms), 91, 92	Broncho, 91	Lobar and unqualified, 92
New York State	**10,539**	**2,188**	**190**	**50**	**6,852**	**21,696**	**4,883**	**1,759**	**16,475**	**7,568**	**8,907**
New York City	**5,317**	**1,075**	**123**	**40**	**718**	**11,342**	**2,824**	**918**	**10,058**	**4,874**	**5,184**
Rest of State	**5,222**	**1,113**	**67**	**10**	**6,134**	**10,354**	**2,059**	**841**	**6,417**	**2,694**	**3,723**
January, total	873	215	19	4	602	2,290	490	205	2,404	973	1,431
New York City	458	116	15	2	61	1,261	306	113	1,672	676	996
Rest of State	415	99	4	2	541	1,029	184	92	732	297	435
February, total	869	235	18	.....	708	2,518	554	357	5,247	2,278	2,969
New York City	441	110	12	.....	85	1,268	324	198	3,108	1,528	1,580
Rest of State	428	125	6	.....	623	1,250	230	159	2,139	750	1,389
March, total	883	205	13	1	656	2,112	497	201	1,910	969	941
New York City	486	98	8	.....	64	1,065	294	117	1,091	607	484
Rest of State	397	107	5	1	592	1,047	203	84	819	362	457
April, total	859	193	20	2	611	1,878	451	209	1,426	681	745
New York City	436	100	10	.....	58	990	261	121	883	423	460
Rest of State	423	93	10	2	553	888	190	88	543	258	285
May, total	903	184	27	.....	628	1,878	378	160	1,180	556	624
New York City	444	94	16	.....	69	958	221	73	630	307	323
Rest of State	459	90	11	.....	559	920	157	87	550	249	301
June, total	850	162	15	1	524	1,533	346	95	645	317	328
New York City	413	88	8	1	40	799	196	43	389	197	192
Rest of State	437	74	7	.....	484	734	150	52	256	120	136
July, total	895	162	13	4	442	1,435	316	63	418	221	197
New York City	409	72	8	4	50	733	174	29	259	142	117
Rest of State	486	90	5	.....	392	702	142	34	159	79	80
August, total	868	163	18	2	497	1,455	348	48	369	204	165
New York City	428	74	10	1	51	760	188	19	262	147	115
Rest of State	440	89	8	1	446	695	160	29	107	57	50
September, total	856	165	8	7	486	1,407	307	79	427	205	222
New York City	422	69	7	6	56	742	179	36	266	131	135
Rest of State	434	96	1	1	430	665	128	43	161	74	87
October, total	901	157	5	17	531	1,528	371	82	580	312	268
New York City	447	85	4	15	65	782	192	40	351	189	162
Rest of State	454	72	1	2	466	746	179	42	229	123	106
November, total	891	185	15	9	528	1,772	388	126	745	353	392
New York City	466	95	12	8	54	965	219	58	477	230	247
Rest of State	425	90	3	1	474	807	169	68	268	123	145
December, total	891	162	19	3	639	1,890	437	134	1,124	499	625
New York City	467	74	13	3	65	1,019	270	71	670	297	373
Rest of State	424	88	6	.....	574	871	167	63	454	202	252

Table 6 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: ***Births, still-births, and deaths, with birth, death, and infant mortality rates by months; also death[8] by broad age groups and important causes, by months:* 1920 — (Continued)**

MONTH	Causes of Death — (*Continued*)									
	Diseases of the digestive system					The puerperal state		Malformations and diseases of early infancy		
	Diarrhea and enteritis (under 2 years), 104	Appendicitis, 108	Hernia, intestinal obstruction, 109	Cirrhosis of liver, 113	Nephritis and Bright's disease, 119, 120	Puerperal septicemia, 137	Other puerperal affections, 134–36, 138–41	Congenital malformations, 150	Premature birth, 151a	Congenital debility, 151b
New York State	**4,662**	**1,406**	**1,215**	**779**	**10,481**	**384**	**1,040**	**1,363**	**4,370**	**1,382**
New York City	**2,545**	**792**	**653**	**366**	**4,833**	**174**	**534**	**649**	**2,149**	**833**
Rest of State	**2,117**	**614**	**562**	**413**	**5,648**	**210**	**506**	**714**	**2,221**	**549**
January, total	221	100	97	81	1,085	35	110	129	455	122
New York City	132	54	55	41	562	14	63	55	222	76
Rest of State	89	46	42	40	523	21	47	74	233	46
February, total	278	89	109	81	1,206	45	133	126	479	135
New York City	151	51	61	41	555	17	42	66	248	81
Rest of State	127	38	48	40	651	28	91	60	231	54
March, total	304	145	118	69	1,029	42	95	128	371	143
New York City	170	86	62	28	510	24	43	62	191	88
Rest of State	134	59	56	41	519	18	52	66	180	55
April, total	272	104	115	73	935	38	77	123	367	138
New York City	142	60	74	43	459	22	42	62	176	88
Rest of State	130	44	41	30	476	16	35	61	191	50
May, total	221	155	114	66	978	45	81	123	412	129
New York City	108	87	55	23	434	22	46	62	195	79
Rest of State	113	68	59	43	544	23	35	61	217	50
June, total	234	113	101	67	800	34	94	132	337	95
New York City	140	63	47	31	365	17	46	60	156	61
Rest of State	94	50	54	36	435	17	48	72	181	34
July, total	443	131	107	53	728	24	75	104	327	73
New York City	299	78	42	24	314	11	33	53	173	52
Rest of State	144	53	65	29	414	13	42	51	154	21
August, total	903	150	86	55	686	28	73	91	302	124
New York City	556	94	50	25	264	13	45	41	126	73
Rest of State	347	56	36	30	422	15	28	50	176	51
September, total	785	98	100	49	718	22	61	85	294	117
New York City	365	46	58	21	324	4	36	40	135	69
Rest of State	420	52	42	28	394	18	25	45	159	48
October, total	525	108	89	51	775	23	75	98	312	131
New York City	238	58	52	24	352	7	37	46	136	73
Rest of State	287	50	37	27	423	16	38	52	176	58
November, total	257	92	86	74	723	22	64	112	333	78
New York City	138	56	46	33	338	9	41	51	187	36
Rest of State	119	36	40	41	385	13	23	61	146	42
December, total	219	121	93	60	818	26	102	112	381	97
New York City	106	59	51	32	356	14	60	51	204	57
Rest of State	113	62	42	28	462	12	42	61	177	40

Table 6 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Births, stillbirths, and deaths, with birth, death, and infant mortality rates by months; also deaths by broad age groups and important causes, by months:* 1920 — (Concluded)

MONTH	CAUSES OF DEATH — (*Concluded*)								
		EXTERNAL CAUSES							
		Accidents							
	Old age, 154	Total accidents, 164–81, 185, 186	Drowning, 169	Railroad accidents, 175a	Automobile accidents, 175c	Other accidents	Suicides, 155–63	Homicides, 182–84	All other causes
New York State	**838**	**7,351**	**726**	**523**	**1,439**	**4,663**	**1,189**	**448**	**19,659**
New York City	**289**	**3,619**	**331**	**89**	**763**	**2,436**	**670**	**325**	**9,023**
Rest of State	**549**	**3,732**	**395**	**434**	**676**	**2,227**	**519**	**123**	**10,636**
January, total	94	605	11	32	57	505	86	28	1,866
New York City	42	348	4	......	39	305	54	21	889
Rest of State	52	257	7	32	18	200	32	7	977
February, total	96	443	6	43	31	363	77	22	1,833
New York City	43	230	3	3	24	200	46	18	872
Rest of State	53	213	3	40	7	163	31	4	961
March, total	97	531	23	43	49	416	92	30	1,920
New York City	30	300	10	8	39	243	47	22	880
Rest of State	67	231	13	35	10	173	45	8	1,040
April, total	65	514	24	29	105	356	113	29	1,811
New York City	17	274	10	7	66	191	58	18	832
Rest of State	48	240	14	22	39	165	55	11	979
May, total	86	585	70	41	123	351	115	35	1,740
New York City	24	277	36	10	64	167	60	26	817
Rest of State	62	308	34	31	59	184	55	9	923
June, total	54	662	123	54	167	318	107	27	1,507
New York City	17	323	57	11	96	159	59	16	704
Rest of State	37	339	66	43	71	159	48	11	803
July, total	39	724	160	40	149	375	97	32	1,419
New York City	13	315	74	7	71	163	50	21	647
Rest of State	26	409	86	33	78	212	47	11	772
August, total	52	725	163	52	144	366	107	29	1,492
New York City	19	312	61	8	66	177	61	16	665
Rest of State	33	413	102	44	78	189	46	13	827
September, total	66	688	54	53	191	390	95	81	1,507
New York City	23	319	30	4	95	190	49	68	671
Rest of State	43	369	24	49	96	200	46	13	836
October, total	52	631	43	44	160	384	99	48	1,505
New York City	18	277	18	10	66	183	61	35	649
Rest of State	34	354	25	34	94	201	38	13	856
November, total	60	644	30	46	152	416	93	38	1,460
New York City	14	333	15	11	82	225	62	30	672
Rest of State	46	311	15	35	70	191	31	8	788
December, total	77	599	19	46	111	423	108	49	1,599
New York City	29	311	13	10	55	233	63	34	725
Rest of State	48	288	6	36	56	190	45	15	874

Table 7 — (a) NEW YORK STATE (exclusive of New York City): *Births, exclusive of legitimacy, and plural births, by color, nativity of mother*

SEX, MONTH OF BIRTH, ATTENDANT AT BIRTH, ORDER OF BIRTH, AGE OF MOTHER, LEGITIMACY, AND PLURAL BIRTHS	Total living births	WHITE								
		Total children born to white mothers	NATIVITY							
			United States	Total foreign-born	Country of					
					England, Scotland, Wales	Ireland	Germany	German Poland	Italy	Russia
Total living births	102,604	101,765	70,608	31,154	1,534	1,489	1,201	60	10,926	2,522
Sex:										
Males	52,852	52,414	36,443	15,969	793	741	634	28	5,498	1,322
Females	49,752	49,351	34,165	15,185	741	748	567	32	5,428	1,200
Month of birth:										
January	8,790	8,703	5,865	2,838	138	119	126	9	939	264
February	8,756	8,677	5,945	2,731	148	152	87	13	939	214
March	9,048	8,964	6,174	2,789	133	142	92	8	967	209
April	8,506	8,435	5,864	2,571	114	114	98	8	925	234
May	8,897	8,828	6,263	2,565	122	116	118	1	892	208
June	8,564	8,501	6,045	2,456	113	133	95	4	840	211
July	9,029	8,954	6,327	2,627	142	125	95	3	942	217
August	9,113	9,062	6,422	2,640	152	141	102	4	936	197
September	8,661	8,598	5,903	2,695	120	134	105	5	926	210
October	8,041	7,999	5,474	2,525	118	104	103	1	938	183
November	7,340	7,279	4,980	2,299	114	96	84	2	836	181
December	7,859	7,765	5,346	2,418	120	113	96	2	846	194
Attendant at birth:										
Physician	89,033	88,284	67,689	20,592	1,504	1,448	1,039	30	6,878	1,824
Midwife	12,812	12,740	2,581	10,159	26	35	154	30	3,798	681
Other	689	676	312	364	3	5	8	....	226	16
None or not stated	70	65	26	39	1	1	.....	....	24	1
Order of birth:										
1st	29,341	29,093	24,289	4,803	475	319	189	8	1,478	395
2nd	21,761	21,594	16,858	4,736	361	306	191	1	1,182	463
3rd	15,930	15,797	10,864	4,932	243	238	200	5	1,425	484
4th	10,948	10,861	6,534	4,327	163	232	131	5	1,472	400
5th	7,753	7,692	4,116	3,576	88	133	116	9	1,396	262
6th	5,484	5,433	2,759	2,674	75	101	91	4	1,142	188
7th	3,860	3,830	1,812	2,018	35	59	66	7	924	110
8th	2,617	2,601	1,163	1,438	30	44	62	4	641	83
9th	1,745	1,731	765	966	21	21	44	3	461	56
10th	1,192	1,181	498	683	17	16	42	6	342	35
11th	712	703	319	384	6	7	20	2	200	20
12th	438	432	190	242	6	3	20	5	109	12
13th	257	255	108	147	4	3	16	1	61	8
14th	120	119	56	63	4	.....	5	....	29	.....
15th	59	58	24	34	1	.....	2	....	18	2
16th	35	34	12	22	.....	1	1	....	10	.....
17th	12	12	4	8	.....	1	1	....	4	.....
18th	3	3	2	1	.....	.....	.....	....	1	.....
19th	4	3	2	1	.....	.....	.....	....	1	.....
20th or more	4	4	2	2	.....	.....	.....	....	2	.....
Unknown or not stated	329	329	231	97	5	5	4	....	28	4
Age of mother:										
Under 15 years	34	30	28	2	.....	.....	.....	....	.....	.....
15–19	7,105	6,984	5,836	1,147	42	4	25	....	645	43
20–24	26,917	26,665	20,716	5,949	288	146	118	8	2,229	507
25–29	29,948	29,752	20,617	9,134	390	403	226	9	2,837	851
30–34	21,124	20,982	13,436	7,546	381	439	329	20	2,553	595
35–39	12,687	12,596	7,288	5,308	319	370	313	16	1,893	407
40–44	4,256	4,228	2,400	1,828	103	120	173	7	693	102
45–49	422	421	214	207	11	3	17	....	67	16
50 and over	12	11	4	7	.....	2	.....	....	1	.....
Unknown or not stated	99	96	69	26	.....	2	.....	....	8	1
Legitimacy:										
Legitimate	101,605	100,811	69,804	31,005	1,518	1,476	1,193	59	10,914	2,516
Illegitimate	999	954	804	149	16	13	8	1	12	6
Plural births:										
Twins (individuals)	2,174	2,166	1,435	731	45	35	28	....	228	70
Triplets (individuals)	14	14	8	6	.....	.....	.....	....	3	3

N. B. In determining the number of child in order of birth

stillbirths, showing sex, month of birth, attendant at birth, order of birth, age of mother, and country of birth of white foreign-born mothers: 1920

Mothers of White Mothers — Birth of Foreign-Born Mothers												Colored Mothers			
Russian Poland	Austria	Austrian Poland	Hungary	Poland unspecified	Total Poland	Canada (French)	Canada (other)	Total Canada	Norway, Sweden, Denmark	Other foreign countries	Country not stated	Total colored	Negro	American Indian	Chinese, Japanese and others
650	2,752	441	637	5,140	6,291	300	1,757	2,057	487	1,258	3	839	749	83	7
330	1,391	223	335	2,693	3,274	147	949	1,096	253	632	2	438	390	44	4
320	1,361	218	302	2,447	3,017	153	808	961	234	626	1	401	359	39	3
74	272	50	68	446	579	17	156	173	47	113	....	87	83	4	....
65	255	41	50	439	558	21	170	191	33	104	1	79	65	13	1
68	293	38	51	480	594	38	139	177	28	103	1	84	73	10	1
44	195	31	52	432	515	25	168	193	31	100	....	71	64	7	....
40	233	[illegible]	50	435	520	30	141	171	45	90	....	69	62	7	....
44	209	[illegible]	62	402	487	15	146	161	39	106	....	63	60	2	1
52	243	[illegible]	54	411	496	28	125	153	52	108	....	75	67	7	1
60	226	[illegible]	48	407	510	22	154	176	42	110	....	51	46	5	....
46	245	[illegible]	59	466	554	30	141	171	58	113	....	63	55	7	1
48	215	[illegible]	42	402	480	23	162	185	50	107	....	42	37	5	....
52	198	[illegible]	52	407	482	14	121	135	33	88	....	61	56	5	....
57	168	[illegible]	49	413	516	37	134	171	29	116	1	94	81	11	2
365	1,465	191	314	1,972	2,558	288	1,728	2,016	467	1,079	3	749	686	56	7
274	1,239	246	314	3,141	3,691	11	26	37	19	165	....	72	58	14	....
11	43	4	8	23	38	1	2	3	1	13	....	13	5	8	....
....	5	....	1	4	4	....	1	1	....	1	....	5	....	5	....
66	286	42	64	458	564	74	497	571	125	337	1	248	230	16	2
104	483	75	103	721	901	58	367	425	109	212	....	167	146	19	2
126	468	88	109	936	1,155	43	256	299	85	226	1	133	113	17	3
104	419	51	105	807	967	24	221	245	60	133	....	87	75	12	....
88	357	47	83	656	800	17	154	171	46	124	....	61	54	7	....
56	230	44	68	475	579	20	79	99	25	76	....	51	46	5	....
28	178	41	38	387	473	16	60	76	14	45	....	30	26	4	....
33	141	20	28	248	305	14	38	52	8	44	....	16	15	1	....
13	72	21	11	179	216	9	23	32	9	23	....	14	12	2	....
6	45	3	14	111	126	7	25	32	2	12	....	11	11	....	....
4	27	4	4	63	73	4	10	14	4	9	....	9	9	....	....
6	21	1	5	35	47	4	12	16	....	3	....	6	6	....	....
5	11	1	....	29	36	1	4	5	....	3	....	2	2	....	....
1	2	2	....	12	15	2	4	6	....	2	....	1	1	....	....
....	2	....	....	4	4	2	....	2	....	3	....	1	1	....	....
2	....	....	....	5	7	1	2	3	....	....	....	1	1	....	....
....	1	....	....	....	....	1	....	1	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
8	9	....	5	14	23	3	5	8	....	6	1	....	....	....	....
....	....	....	....	....	....	....	1	1	....	1	....	4	4	....	....
10	52	4	18	106	120	24	90	114	13	71	1	121	115	6	....
104	563	84	119	956	1,152	76	372	448	64	315	....	252	222	26	4
248	929	172	214	1,819	2,248	56	481	537	128	371	1	196	170	24	2
163	674	101	153	1,253	1,537	66	407	473	139	273	....	142	127	15	....
97	407	59	100	737	909	51	273	324	101	165	....	91	80	10	1
23	105	18	31	230	278	24	115	139	34	50	....	28	26	2	....
5	16	2	....	33	40	2	16	18	7	12	....	1	1	....	....
....	....	....	1	1	1	1	1	2	....	....	....	1	1	....	....
....	6	1	1	5	6	....	1	1	1	....	1	3	3	....	....
649	2,735	441	632	5,121	6,270	298	1,719	2,017	483	1,251	2	794	705	82	7
1	17	....	5	19	21	2	38	40	4	7	1	45	44	1	....
12	64	8	12	125	145	12	48	60	10	34	....	8	6	2	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Previous stillbirths in some cases may have been included.

Table 7 — (b) NEW YORK STATE (exclusive of New York City): *Illegitimate living plural births, by color, nativity of mother, and country of birth of*

ex, Month of Birth, Attendant at Birth, Order of Birth, Age of Mother, Legitimacy, and Plural Births	Total illegitimate living births	White								
		Total births to white mothers	Nativity							
			United States	Total foreign-born	Country of					
					England, Scotland, Wales	Ireland	Germany	German Poland	Italy	Russia
Total living births	**999**	**954**	**804**	**149**	**16**	**13**	**8**	**1**	**12**	**6**
Sex:										
Males	518	494	413	80	5	6	4	...	6	2
Females	481	460	391	69	11	7	4	1	6	4
Month of birth:										
January	96	92	79	13	2	3	...	...	1	...
February	86	81	67	14	1	...	...	...	3	...
March	110	105	85	20	2	1	1	...	2	2
April	94	87	69	18	1	1	1	1	2	1
May	80	79	71	8	1	2	...	...	...	...
June	91	89	80	9	1	2	...	...	1	...
July	99	92	80	12	1	1	3	...	1	...
August	88	87	76	11	4	...	1	...	...	...
September	64	59	52	7	...	...	...	...	...	...
October	64	64	51	13	2	1	2	...	1	...
November	52	47	34	13	1	...	...	...	...	3
December	75	72	60	11	...	2	...	...	1	...
Attendant at birth:										
Physician	947	903	780	122	16	13	7	1	10	4
Midwife	40	39	14	25	...	...	...	...	2	2
Other	6	6	4	2	...	...	1	...	...	...
None or not stated	6	6	6	...	...	...	...	...	...	...
Order of birth:										
1st	827	792	692	99	13	10	5	1	5	4
2nd	95	88	67	21	2	2	1	...	2	1
3rd	20	19	12	7	1	1	2	...	...	1
4th	23	21	13	8	...	...	...	...	3	...
5th	10	10	8	2	...	...	...	...	1	...
6th	6	6	...	6	...	...	...	...	1	...
7th	8	8	6	2	...	...	...	...	...	...
8th	2	2	...	2	...	...	...	...	...	...
9th	...	...	...	...	...	...	...	...	...	...
10th	3	3	2	1	...	...	...	...	...	...
11th	...	...	...	...	...	...	...	...	...	...
12th	...	...	...	...	...	...	...	...	...	...
13th	...	...	...	...	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...	...
15th	1	1	1	...	...	...	...	...	...	...
16th	...	...	...	...	...	...	...	...	...	...
17th	...	...	...	...	...	...	...	...	...	...
18th	...	...	...	...	...	...	...	...	...	...
19th	...	...	...	...	...	...	...	...	...	...
20th or more	...	...	...	...	...	...	...	...	...	...
Unknown or not stated	4	4	3	1	...	...	...	...	...	...
Age of mother:										
Under 15 years	21	17	16	1	...	...	...	...	...	...
15–19	437	412	375	36	5	...	2	...	3	3
20–24	336	325	275	50	5	6	2	1	3	1
25–29	114	111	79	32	5	7	2	...	2	2
30–34	50	48	30	18	1	...	...	...	3	...
35–39	34	34	24	10	...	...	1	...	1	...
40–44	6	6	4	2	...	...	1	...	...	...
45–49	...	...	...	...	...	...	...	...	...	...
50 and over	...	...	...	...	...	...	...	...	...	...
Age not stated	1	1	1	...	...	...	...	...	...	...
Plural births:										
Twins (individuals)	17	17	14	3	...	...	1	...	...	...
Triplets (individuals)	...	...	...	...	...	...	...	...	...	...

N. B. In determining the number of child in order of birth

births, showing sex, month of birth, attendant at birth, order of birth, age of mother, and white foreign-born mothers: **1920** — (Concluded)

Mothers — of White Mothers — Birth of Foreign-Born Mothers: Russian Poland	Austria	Austrian Poland	Hungary	Poland unspecified	Total Poland	Canada (French)	Canada (other)	Total Canada	Norway, Sweden, Denmark	Other foreign countries	Country not stated	Colored Mothers: Total colored	Negro	American Indian	Chinese, Japanese and others
1	17	....	5	19	21	2	38	40	4	7	1	45	44	1	....
1	9	....	2	15	16	1	22	23	2	5	1	24	24	....	...
....	8	....	3	4	5	1	16	17	2	2	....	21	20	1	....
....	2	....	....	1	1	....	4	4	....	....	....	4	4	....	....
....	1	....	....	2	2	....	6	6	1	....	....	5	4	1	....
....	2	....	....	2	2	....	8	8	....	....	....	5	5	....	....
....	....	....	....	3	4	1	5	6	....	2	....	7	7	....	....
1	....	....	....	2	3	....	....	....	1	1	....	1	1	....	....
....	2	....	....	1	1	1	1	2	....	....	....	2	2	....	....
....	2	....	....	....	....	....	3	3	....	1	....	7	7	....	....
....	2	....	....	1	1	....	3	3	....	....	....	1	1	....	....
....	....	....	1	4	4	....	2	2	....	....	....	5	5	....	....
....	3	....	....	....	....	....	2	2	1	1	....	....	....	....	....
....	2	....	....	2	2	....	3	3	1	1	....	5	5	....	....
....	1	....	4	1	1	....	1	1	....	1	1	3	3	....	...
1	7	....	2	12	14	2	37	39	3	7	1	44	44	....	....
....	10	....	3	7	7	....	1	1	....	....	....	1	....	1	....
....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	7	....	2	8	9	2	32	34	4	6	1	35	34	1	....
1	6	....	1	3	4	....	2	2	....	....	....	7	7	....	....
....	1	....	....	1	1	....	....	....	....	....	....	1	1	....	....
....	1	....	1	2	2	....	1	1	....	....	....	2	2	....	....
....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....
....	1	....	....	3	3	....	1	1	....	....	....	....	....	....	....
....	1	....	....	....	....	....	1	1	....	....	....	....	....	....	....
....	....	....	1	1	1	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
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....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....
....	....	....	....	....	....	....	1	1	....	....	....	4	4	....	....
....	1	....	1	4	4	1	13	14	1	2	1	25	25	....	....
....	7	....	1	6	7	1	14	15	....	3	....	11	10	1	....
1	2	....	1	2	8	....	5	5	2	1	....	3	3	....	....
....	4	....	2	3	3	....	3	3	1	1	....	2	2	....	....
....	3	....	....	4	4	....	1	1	....	....	....	....	....	....	....
....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

previous stillbirths in some cases may have been included.

Table 8 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Births each month, by sex and color; also stillbirths, by months:* 1920

MONTH	LIVING BIRTHS								Stillbirths
	Total	SEX		COLOR					
		Male	Female	White	Negro	Indian	Chinese	Japanese	
NEW YORK STATE......	235,460	121,414	114,046	230,411	4,878	83	34	54	10,182
New York City......	132,856	68,562	64,294	128,646	4,129	......	31	50	6,232
Rest of State........	102,604	52,852	49,752	101,765	749	83	3	4	3,950
January, total..........	20,070	10,349	9,721	19,630	430	4	2	4	905
New York City......	11,280	5,800	5,480	10,927	347	......	2	4	538
Rest of State........	8,790	4,549	4,241	8,703	83	4	....	....	367
February, total.........	20,011	10,177	9,834	19,618	377	13	1	2	971
New York City......	11,255	5,747	5,508	10,941	312	......	....	2	557
Rest of State........	8,756	4,430	4,326	8,677	65	13	1	....	414
March, total...........	21,195	10,978	10,217	20,740	432	10	4	9	862
New York City......	12,147	6,291	5,856	11,776	359	......	4	8	537
Rest of State........	9,048	4,687	4,361	8,964	73	10	....	1	325
April, total............	19,712	10,300	9,412	19,319	376	7	5	5	833
New York City......	11,206	5,852	5,354	10,884	312	......	5	5	501
Rest of State........	8,506	4,448	4,058	8,435	64	7	....	....	332
May, total............	19,261	9,971	9,290	18,880	371	7	1	2	873
New York City......	10,364	5,365	4,999	10,052	309	......	1	2	525
Rest of State.......	8,897	4,606	4,291	8,828	62	7	....	....	348
June, total............	20,374	10,500	9,874	19,909	451	2	8	4	791
New York City......	11,810	6,090	5,720	11,408	391	......	7	4	499
Rest of State........	8,564	4,410	4,154	8,501	60	2	1	....	292

Table 8 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Births each month, by sex and color; also stillbirths, by months:* 1920 — (Concluded)

MONTH	LIVING BIRTHS								Still-births
	Total	SEX		COLOR					
		Male	Female	White	Negro	Indian	Chinese	Japanese	
July, total	20,645	10,634	10,011	20,136	496	7	3	3	827
New York City	11,616	5,943	5,673	11,182	429	......	3	2	509
Rest of State	9,029	4,691	4,338	8,954	67	7	....	1	318
August, total	20,263	10,431	9,832	19,892	362	5	....	4	781
New York City	11,150	5,717	5,433	10,830	316	......	....	4	469
Rest of State	9,113	4,714	4,399	9,062	46	5	....	....	312
September, total	19,530	9,956	9,574	19,101	419	7	1	2	807
New York City	10,869	5,572	5,297	10,503	364	......	1	1	520
Rest of State	8,661	4,384	4,277	8,598	55	7	....	1	287
October, total	18,391	9,406	8,985	18,006	376	5	3	1	803
New York City	10,350	5,298	5,052	10,007	339	......	3	1	485
Rest of State	8,041	4,108	3,933	7,999	37	5	....	....	318
November, total	17,272	8,965	8,307	16,899	356	5	2	10	835
New York City	9,932	5,171	4,761	9,620	300	......	2	10	508
Rest of State	7,340	3,794	3,546	7,279	56	5	....	....	327
December, total	18,736	9,747	8,989	18,281	432	11	4	8	894
New York City	10,877	5,716	5,161	10,516	351	......	3	7	584
Rest of State	7,859	4,031	3,828	7,765	81	11	1	1	310

Table 9 — NEW YORK STATE: ***Movement of infant and childhood mortality,† showing annual number of births registered, deaths at all ages, deaths under one year of age with rate per 1,000 living births, and deaths under five years of age; with percentages of all deaths occurring under one year and under five years of age: 1885–1920***

YEAR	BIRTHS	DEATHS					
			UNDER 1 YEAR			UNDER 5 YEARS	
	Number registered* (stillbirths excluded)	Total at all ages (stillbirths excluded)	Number	Per 1,000 living births	Per cent of deaths under 1 to total deaths	Number	Per cent of deaths under 5 to total deaths
1885	63,536	80,407	....	......	......	30,027	37.3
1886	89,828	86,801	....	......	......	32,928	37.9
1887	102,038	108,269	....	......	......	35,114	32.4
1888	103,089	114,584	....	......	......	38,345	33.5
1889	114,804	113,155	....	......	......	40,243	35.5
1890	112,572	128,648	....	......	......	37,392	29.1
1891	125,909	129,850	....	......	......	42,740	32.9
1892	130,143	131,388	....	......	......	42,434	32.3
1893	136,297	129,659	....	......	......	41,643	32.1
1894	141,827	123,423	....	......	......	41,472	33.6
1895	142,311	128,834	....	......	......	42,002	32.6
1896	147,327	126,253	....	......	......	40,136	31.7
1897	144,631	118,525	....	......	......	35,771	30.1
1898	138,702	122,584	....	......	......	37,113	30.2
1899	136,778	121,831	....	......	......	35,386	29.0
1900	143,156	132,089	....	......	......	39,204	29.6
1901	140,539	131,335	....	......	......	35,775	27.2
1902	146,740	124,830	....	......	......	31,215	25.0
1903	158,343	127,498	....	......	......	32,768	25.7
1904	165,014	142,217	24,909	151	17.5	39,086	27.5
1905	172,259	137,435	25,827	150	18.8	38,045	27.7
1906	183,012	141,099	27,114	148	19.2	39,290	27.9
1907	196,020	147,130	28,011	143	19.0	40,168	27.3
1908	203,159	138,912	26,561	131	19.1	37,941	27.3
1909	202,656	140,261	26,077	129	18.6	38,278	27.3
1910	213,235	147,710	27,534	129	18.6	39,848	27.0
1911	221,678	145,912	25,316	114	17.3	36,156	24.6
1912	227,120	142,377	24,681	109	17.3	34,787	24.4
1913	228,713	145,274	25,044	109	17.2	35,596	24.5
1914	240,038	145,476	23,731	99	16.3	33,082	22.7
1915	242,950	146,892	24,079	99	16.4	33,584	22.9
1916	240,817	151,543	22,731	94	15.0	33,618	20.2
1917	246,453	154,127	22,473	91	14.6	31,428	20.4
1918	242,704	§192,318	23,524	97	12.2	37,429	19.5
1919	226,269	143,401	18,976	84	13.2	27,048	18.9
1920	235,460	144,466	20,326	86	14.1	29,584	20.5

* Deaths under one year were not compiled separately until 1904. The registration of births was very incomplete for the early years and can scarcely be taken as approximately complete prior to 1908. On this account even for later years the infant mortality (*i. e.* ratio of deaths under one year per 1,000 living births) is too high.

† Similar data for New York City, and rest of State, for 1905–1920 shown in table 10.

§ Civilian population only, except for New York City.

Table 10 — New York City and Rest of State: *Movement of infant and childhood mortality,† showing annual number of births registered, birth rates, deaths at all ages, deaths under one year of age, with rates per 1,000 living births, and deaths under five years of age:* **1905–1920**

YEAR	Births		Deaths			
				Under 1 year		Under 5 years
	Number registered (stillbirths excluded)	Rate per 1,000 population	Total at all ages (stillbirths excluded)	Number (stillbirths excluded)	Per 1,000 living births	Number
1905:						
New York City......	103,881	25.2	73,714	16,435	158	24,539
Rest of State........	68,378	16.7	63,721	9,392	137	13,506
1906:						
New York City......	111,773	26.2	76,203	17,165	154	25,752
Rest of State........	71,239	17.2	64,896	9,949	140	13,538
1907:						
New York City......	120,716	27.5	79,205	17,518	145	25,812
Rest of State........	75,304	17.9	67,925	10,498	139	14,356
1908:						
New York City......	126,862	28.0	73,075	16,211	128	24,134
Rest of State........	76,297	17.9	65,837	10,350	136	13,807
1909:						
New York City......	122,367	26.3	74,105	15,944	130	24,496
Rest of State........	80,289	18.6	66,156	10,138	126	13,782
1910:						
New York City......	129,081	27.0	76,750	16,202	126	24,278
Rest of State........	84,154	19.3	70,960	11,332	135	15,570
1911:						
New York City......	134,541	27.6	75,423	15,016	112	22,233
Rest of State........	87,137	19.8	70,489	10,300	118	13,923
1912:						
New York City......	135,581	27.3	73,019	14,266	105	20,984
Rest of State........	91,589	20.6	69,358	10,415	114	13,803
1913:						
New York City......	135,123	26.8	73,908	13,782	102	20,715
Rest of State........	93,590	20.9	71,371	11,262	120	14,831
1914:						
New York City......	140,528	27.4	74,803	13,295	95	19,531
Rest of State........	99,510	22.0	70,673	10,435	105	13,551
1915:						
New York City......	141,354	27.1	76,193	13,865	98	20,290
Rest of State........	101,596	22.2	70,699	10,214	100	13,294
1916:						
New York City......	137,287	25.8	77,800	12,819	93	19,967
Rest of State........	103,530	22.4	73,743	9,912	96	13,651
1917:						
New York City......	141,564	26.2	78,575	12,565	89	18,262
Rest of State........	104,889	22.5	75,552	9,906	94	13,166
1918:						
New York City......	138,046	25.2	98,119	12,657	92	21,019
Rest of State........	104,658	22.3	§94,199	10,867	104	16,410
1919:						
New York City......	130,377	23.4	74,433	10,639	82	15,744
Rest of State........	95,892	20.2	68,968	8,337	87	11,304
1920:						
New York City......	132,856	23.5	73,249	11,340	85	17,288
Rest of State........	102,604	21.4	71,217	8,986	88	12,296

* Registration of births known to be incomplete until recent years, particularly in the State outside of New York City. Consequently recorded birth rates in earlier years for rest of State are too low and corresponding infant mortality rates (ratio of deaths under 1 year per 1,000 living births) too high.

† Similar data for entire State for 1885–1920 shown in table 9.

§ Civilian population only.

Table 11 — NEW YORK CITY and REST OF STATE, *by individual counties: Genera summary showing population, births, stillbirths, deaths, and marriages, with annual birth, death, and marriage rates per 1,000 estimated population:* 1920

Line No.	AREA	Population * (estimated) 1920	Births (stillbirths excluded)	Stillbirths	Deaths (stillbirths excluded)	Marriages	RATES† Birth	Death	Persons marrying
1	NEW YORK STATE..	10,450,716	235,460	10,182	144,466	111,280	22.5	13.8	21.3
2	New York City...	5,663,988	132,856	6,232	73,249	64,422	23.5	12.9	22.7
3	Rest of State....	4,786,728	192,604	3,950	71,217	46,858	21.4	14.9	19.6
4	Albany............	186,746	3,543	129	2,779	1,930	19.0	14.9	20.7
5	Allegany..........	36,607	647	30	585	396	17.7	16.0	21.6
6	Broome...........	115,402	2,867	109	1,830	1,387	24.8	15.9	24.0
7	Cattaraugus.......	71,601	1,553	60	1,028	865	21.7	14.4	24.2
8	Cayuga....	65,124	1,191	42	1,060	621	18.3	16.3	19.1
9	Chautauqua.......	115,874	2,444	86	1,612	1,754	21.1	13.9	30.3
10	Chemung.........	66,449	1,462	56	869	790	22.0	13.1	23.8
11	Chenango.........	34,938	620	26	597	309	17.7	17.1	17.7
12	Clinton...........	43,675	1,145	57	700	369	26.2	16.0	16.9
13	Columbia..........	38,687	735	25	638	390	19.0	16.5	20.2
14	Cortland..........	29,644	616	28	480	319	20.8	16.2	21.5
15	Delaware..........	42,630	813	17	662	385	19.1	15.5	18.1
16	Dutchess..........	91,957	1,693	53	1,774	831	18.4	19.3	18.1
17	Erie.............	640,132	16,457	653	9,190	7,337	25.7	14.4	22.9
18	Essex............	31,789	745	27	545	207	23.4	17.1	13.0
19	Franklin..........	43,429	1,096	42	867	347	25.2	20.0	16.0
20	Fulton............	44,947	846	26	751	445	18.8	16.7	19.8
21	Genesee..........	37,994	778	23	559	339	20.5	14.7	17.8
22	Greene...........	25,569	436	13	450	195	17.1	17.6	15.3
23	Hamilton..........	3,949	79	3	49	19	20.0	12.4	9.6
24	Herkimer..........	65,405	1,436	44	860	583	22.0	13.1	17.8
25	Jefferson..........	82,346	1,722	77	1,355	824	20.9	16.5	20.0
26	Lewis............	23,645	489	21	340	180	20.7	14.4	15.2
27	Livingston.........	36,768	686	28	597	257	18.7	16.2	14.0
28	Madison..........	39,548	828	33	629	288	20.9	15.9	14.6
20	Monroe...........	355,578	7,688	278	4,538	3,721	21.6	12.8	20.9
30	Montgomery.......	57,946	1,271	41	794	568	21.9	13.7	19.6
31	Nassau...........	128,293	2,788	91	1,343	1,079	21.7	10.5	16.8
32	Niagara...........	120,078	2,928	101	1,569	1,334	24.4	13.1	22.2
33	Oneida...........	184,310	4,325	179	2,839	1,788	23.5	15.4	19.4

Table 11 — NEW YORK CITY and REST OF STATE, *by individual counties: General summary showing population, births, stillbirths, deaths, and marriages, with annual birth, death, and marriage rates per* 1,000 *estimated population:* 1920 — (Concluded)

Line No.	AREA	Population * (estimated) 1920	Births (stillbirths excluded)	Stillbirths	Deaths (stillbirths excluded)	Marriages	RATES † Birth	Death	Persons marrying
34	Onondaga	243,585	5,418	245	3,619	2,064	22.2	14.9	16.9
35	Ontario	52,671	1,094	47	871	464	20.8	16.5	17.6
36	Orange	120,042	2,365	106	1,929	1,107	19.7	16.1	18.4
37	Orleans	28,445	547	24	414	225	19.2	14.6	15.8
38	Oswego	71,013	1,547	51	1,055	496	21.8	14.9	14.0
39	Otsego	46,148	818	37	722	399	17.7	15.6	17.3
40	Putnam	10,603	230	5	170	95	21.7	16.0	17.9
41	Rensselaer	112,658	1,947	100	1,851	1,106	17.3	16.4	19.6
42	Rockland	45,480	884	35	674	381	19.4	14.8	16.8
43	St. Lawrence	88,076	1,967	106	1,507	767	22.3	17.1	17.4
44	Saratoga	59,932	1,193	59	916	540	19.9	15.3	18.0
45	Schenectady	110,451	2,332	78	1,199	935	21.1	10.9	16.9
46	Schoharie	21,172	377	19	350	186	17.8	16.5	17.6
47	Schuyler	13,052	256	7	232	125	19.6	17.8	19.2
48	Seneca	24,620	415	15	638	139	16.9	25.9	11.3
49	Steuben	80,486	1,682	66	1,437	968	20.9	17.9	24.1
50	Suffolk	110,973	2,143	76	2,241	842	19.3	20.2	15.2
51	Sullivan	33,130	539	18	625	243	16.3	18.9	14.7
52	Tioga	24,139	416	11	394	297	17.2	16.3	24.6
53	Tompkins	35,369	684	20	531	323	19.3	15.0	18.3
54	Ulster	74,114	1,282	51	1,236	726	17.3	16.7	19.6
55	Warren	31,645	680	30	503	299	21.5	15.9	18.9
56	Washington	44,739	810	32	613	384	18.1	13.7	17.2
57	Wayne	48,757	864	24	695	394	17.7	14.3	16.2
58	Westchester	347,597	7,379	271	4,205	3,189	21.2	12.1	18.3
59	Wyoming	30,233	554	13	431	183	18.3	14.3	12.1
60	Yates	16,538	254	6	270	124	15.4	16.3	15.0

* Population estimates based upon the United States censuses of 1910 and 1920.
† Total births, deaths, and persons marrying respectively per 1,000 estimated population.

Table 12 — New York State Cities: *General summary, showing population, births, stillbirths, deaths, and deaths under one year during 1920, with corresponding birth and death rates per 1,000 estimated population, for 1920 in comparison with 1913–1917; also infant mortality rates for 1920 and 1919*

Line No.	CITY	Population* (estimated) 1920	Births (still-births excluded)	Still-births	DEATHS — Deaths at all ages (still-births excluded)	DEATHS — Under 1 year
1	NEW YORK STATE	10,450,716	235,460	10,182	144,466	20,326
2	New York City	5,663,988	132,856	6,232	73,249	11,340
3	Rest of State	4,786,728	102,604	3,950	71,217	8,986
4	Cities§	2,506,189	59,738	2,408	35,383	5,479
5	Rural§	2,234,675	42,575	1,532	32,490	3,332
6	Institutional districts§	45,864	291	10	3,344	175
7	*I Cities over 175,000*	*806,056*	*20,049*	*800*	*10,857*	*1,936*
8	Buffalo§	508,699	13,317	553	7,249	1,369
9	Rochester§	297,357	6,732	247	3,608	567
10	*II Cities 50,000–175,000*	*759,484*	*17,906*	*703*	*10,588*	*1,636*
11	Albany	114,018	2,294	74	1,786	179
12	Binghamton§	64,926	1,677	52	934	152
13	Niagara Falls	51,806	1,550	60	657	145
14	Schenectady	89,542	1,968	69	956	169
15	Syracuse§	172,839	4,191	193	2,634	437
16	Troy	71,766	1,385	74	1,222	142
17	Utica§	93,368	2,442	94	1,246	209
18	Yonkers	101,225	2,399	87	1,153	213
19	*IIIa Cities 20,000–50,000*	*513,826*	*11,539*	*468*	*7,480*	*1,014*
20	Amsterdam	33,640	835	29	414	73
21	Auburn§	35,057	764	26	580	81
22	Cohoes	22,899	422	24	329	46
23	Elmira§	44,953	1,168	47	581	84
24	Gloversville	22,149	443	16	397	39
25	Jamestown	39,309	813	29	538	70
26	Kingston	26,728	496	20	450	40
27	Lockport	21,490	417	14	290	43
28	Mount Vernon	43,384	956	34	524	78
29	Newburgh	30,498	675	29	498	62
30	New Rochelle	36,591	673	37	401	44
31	Olean	20,803	544	23	306	47
32	Oswego	23,639	565	16	284	42
33	Poughkeepsie	35,364	813	31	516	78
34	Rome§	24,629	691	35	489	71
35	Watertown	31,519	787	44	616	88
36	White Plains	21,234	477	14	267	31

For footnotes, see pages 262, 263.

Table 12 — NEW YORK STATE CITIES: *General summary, showing population, births, stillbirths, deaths, and deaths under one year during* 1920, *with corresponding birth and death rates per* 1,000 *estimated population, for* 1920 *in comparison with* 1913–1917; *also infant mortality rates for* 1920 *and* 1919 — (Continued)

Line No.	CITY	RATES					
		BIRTH		DEATH		INFANT MORTALITY	
		1920	Annual average, 1913–1917	1920	Annual average, 1913–1917	1920	1919
1	NEW YORK STATE	22.5	24.5	13.8	15.2	[illegible]	84
2	New York City	23.5	26.6	12.9	14.6	85	82
3	Rest of State	21.4	22.0	14.9	15.8	88	87
4	Cities§	23.6	24.9	14.1	14.7	92	82
5	Rural§	19.1	19.5	14.5	16.0	78	77
6	Institutional districts§	....	......	....	......	......	....
7	*I Cities over 175,000*	*24.9*	*26.5*	*13.5*	*12.5*	*97*	*98*
8	Buffalo§	26.2	27.1	14.3	12.0	103	120
9	Rochester§	22.6	25.1	12.1	13.2	84	73
10	*II Cities 50,000–175,000*	*23.6*	*24.8*	*13.9*	*15.8*	*91*	*91*
11	Albany	20.1	20.1	15.7	18.9	78	81
12	Binghamton§	25.8	25.1	14.4	16.6	91	94
13	Niagara Falls	29.9	35.0	12.7	15.1	94	113
14	Schenectady	22.0	26.5	10.7	12.7	85	79
15	Syracuse§	24.2	23.3	15.2	11.5	104	91
16	Troy	19.3	18.5	17.0	20.7	103	117
17	Utica§	26.2	29.3	13.3	16.6	83	86
18	Yonkers	23.7	27.6	11.4	13.0	88	81
19	*IIIa Cities 20,000–50,000*	*22.5*	*23.2*	*14.6*	*15.5*	*88*	*88*
20	Amsterdam	24.3	30.1	12.3	15.1	86	96
21	Auburn§	21.6	22.6	16.5	16.2	106	89
22	Cohoes	18.4	24.6	14.4	16.7	104	97
23	Elmira§	26.9	22.1	12.9	16.0	72	79
24	Gloversville	20.9	20.2	17.9	15.5	88	87
25	Jamestown	20.7	23.2	13.7	13.1	86	68
26	Kingston	18.6	17.4	16.8	18.6	81	100
27	Lockport	19.4	18.0	13.5	15.2	103	106
28	Mount Vernon	22.1	24.1	12.1	11.4	82	61
29	Newburgh	22.1	19.1	16.3	17.5	92	91
30	New Rochelle	18.4	22.2	11.0	11.1	65	79
31	Olean	26.2	26.9	14.7	13.4	86	96
32	Oswego	23.9	23.2	12.0	16.4	74	73
33	Poughkeepsie	23.9	24.4	14.6	17.2	96	91
34	Rome§	28.1	29.7	19.9	21.7	103	81
35	Watertown	25.0	30.6	19.5	16.6	112	90
36	White Plains	22.5	26.2	12.6	13.8	85	62

Table 12 — NEW YORK STATE CITIES: *General summary, showing population, births, stillbirths, deaths, and deaths under one year during* 1920, *with corresponding birth and death rates per* 1,000 *estimated population, for* 1920 *in comparison with* 1913–1917; *also infant mortality rates for* 1920 *and* 1919 — (Continued)

Line No.	CITY	Population* (estimated) 1920	Births (stillbirths excluded)	Stillbirths	DEATHS — Deaths at all ages (stillbirths excluded)	DEATHS — Under 1 year
37	*IIIb Cities 10,000–20,000*	*373,275*	*8,953*	*378*	*5,693*	*813*
38	Batavia	13,640	348	16	247	33
39	Beacon§	10,099	206	5	169	24
40	Corning	15,928	427	13	242	27
41	Cortland	13,386	290	19	231	19
42	Dunkirk	19,445	567	19	248	51
43	Fulton	13,175	316	15	176	28
44	Geneva	14,761	378	15	235	47
45	Glens Falls	16,710	401	21	274	33
46	Hornell	15,097	295	9	221	18
47	Hudson§	11,404	316	11	203	22
48	Ithaca	17,177	350	12	274	33
49	Johnstown	10,932	184	3	141	16
50	Lackawanna§	17,861	613	17	194	72
51	Little Falls	13,068	352	9	170	30
52	Middletown§	16,346	310	26	275	25
53	North Tonawanda	15,663	414	16	191	38
54	Ogdensburg§	12,266	327	16	308	62
55	Oneida	10,655	296	13	160	22
56	Oneonta	11,690	254	14	188	13
57	Peekskill, village	15,900	335	15	226	30
58	Plattsburg	10,897	289	18	233	25
59	Port Chester, village	16,767	545	20	208	36
60	Port Jervis	10,202	249	7	202	23
61	Rensselaer	10,829	101	10	114	10
62	Saratoga Springs	13,154	273	21	251	22
63	Tonawanda	10,159	222	9	101	25
64	Watervliet	16,124	295	9	211	29
65	*IIIc Cities under 10,000*	*53,548*	*1,891*	*59*	*765*	*80*
66	Canandaigua	7,363	216	8	176	8
67	Glen Cove	8,757	233	9	80	20
68	Mechanicville	8,245	194	10	107	12
69	Norwich	8,311	179	11	135	9
70	Ossining, village§	9,645	228	9	132	13
71	Salamanca	9,428	219	9	131	18
72	Sherrill	1,799	22	3	4	....

* Population estimates (July 1) based upon the average annual increase or decrease between the United States censuses of 1910 and 1920.

§ Important State institutions and certain other large institutions whose inmates are mainly onresidents, have been constituted separate registration districts and the populations and deaths

Table 12 — NEW YORK STATE CITIES: *General summary, showing population, births, stillbirths, deaths, and deaths under one year during* 1920, *with corresponding birth, and death rates per* 1,000 *estimated population, for* 1920 *in comparison with* 1913–1917; *also infant mortality rates for* 1920 *and* 1919 — (Concluded)

Line No.		CITY	RATES: Birth, 1920	RATES: Birth, Annual average, 1913–1917	RATES: Death, 1920	RATES: Death, Annual average, 1913–1917	RATES: Infant mortality, 1920	RATES: Infant mortality, 1919
37	*IIIb*	*Cities 10,000–20,000*	*24.0*	*24.1*	*15.3*	*16.8*	*91*	*87*
38		Batavia	25.5	26.0	18.1	18.7	95	82
39		Beacon§	20.4	22.9	16.7	16.6	117	115
40		Corning	26.8	20.3	15.2	14.9	63	60
41		Cortland	21.7	21.3	17.3	18.2	66	77
42		Dunkirk	29.2	30.3	12.8	14.2	90	91
43		Fulton	24.0	25.1	13.4	15.1	89	74
44		Geneva	25.6	24.4	15.9	15.9	124	116
45		Glens Falls	24.0	19.6	16.4	17.8	82	83
46		Hornell	19.5	19.1	14.6	15.1	61	55
47		Hudson§	27.7	28.3	17.8	19.7	70	98
48		Ithaca	20.4	20.3	16.0	16.5	94	63
49		Johnstown	16.8	18.3	12.9	12.7	87	103
50		Lackawanna§	34.3	†	10.9	†	117	115
51		Little Falls	26.9	33.5	13.0	19.0	85	103
52		Middletown§	19.0	18.4	16.8	18.2	81	64
53		North Tonawanda	26.4	30.3	12.2	12.9	92	112
54		Ogdensburg§	26.7	27.6	25.1	21.8	190	123
55		Oneida	27.8	21.8	15.0	16.8	74	56
56		Oneonta	21.7	20.5	16.1	16.1	51	52
57		Peekskill, village	21.1	20.2	14.2	15.3	90	68
58		Plattsburg	26.5	21.9	21.4	18.6	87	130
59		Port Chester, village	32.5	35.7	12.4	14.0	66	79
60		Port Jervis	24.4	17.5	19.8	18.7	92	135
61		Rensselaer	9.3	14.1	10.5	12.9	99	49
62		Saratoga Springs	20.8	18.4	19.1	22.1	81	93
63		Tonawanda	21.9	20.0	9.9	11.4	113	119
64		Watervliet	18.3	17.1	13.1	14.4	98	93
65	*IIIc*	*Cities under 10,000*	*24.1*	*24.4*	*14.3*	*16.4*	*62*	*104*
66		Canandaigua	29.3	25.8	23.9	23.3	37	95
67		Glen Cove	26.6	......	9.1	......	86	67
68		Mechanicville	23.5	32.3	13.0	11.9	62	89
69		Norwich	21.5	21.1	16.2	17.1	50	92
70		Ossining, village§	23.6	21.7	13.7	15.8	57	43
71		Salamanca	23.2	22.4	13.9	14.2	82	93
72		Sherrill‡	12.2	......	2.2	......	......	....

espectively of the cities and areas indicated above are exclusive of the inmate population and deaths of these institutions.

† Separate data on births and deaths occurring in Our Lady of Victory Infant Home, Lackawanna, during 1913–17 not available.

‡ Special charter.

Table 13 — NEW YORK STATE CITIES: ***Deaths classified by broad age groups and important causes; also by groups of cities and for total rural and urban areas outside of New York City:*** **1920**

Line No.	CITIES	Estimated population * 1920	Total births (stillbirths excluded)	Stillbirths	Total deaths (stillbirths excluded)	Age in Years: Under 1	1–4	Total under 5 years	5–59	60 years and over	Unknown
1	**NEW YORK STATE**	**10,450,716**	**235,460**	**10,182**	**144,466**	**20,326**	**9,258**	**29,584**	**62,365**	**52,448**	**69**
2	**New York City**	**5,663,988**	**132,856**	**6,232**	**73,249**	**11,340**	**5,948**	**17,288**	**35,439**	**20,522**	..
3	**Rest of State**	**4,786,728**	**102,604**	**3,950**	**71,217**	**8,986**	**3,310**	**12,296**	**26,926**	**31,926**	**69**
4	**Cities §**	**2,506,189**	**59,738**	**2,408**	**35,383**	**5,479**	**2,149**	**7,628**	**14,453**	**13,285**	**17**
5	**Rural §**	**2,234,675**	**42,575**	**1,532**	**32,490**	**3,332**	**1,137**	**4,469**	**10,687**	**17,286**	**48**
6	**Institutional districts §**	**45,864**	**291**	**10**	**3,344**	**175**	**24**	**199**	**1,786**	**1,355**	**4**
7	*I Cities over 175,000*	*806,056*	*20,049*	*800*	*10,857*	*1,936*	*768*	*2,704*	*4,613*	*3,539*	*1*
8	Buffalo§	508,699	13,317	553	7,249	1,369	549	1,918	3,173	2,158	..
9	Rochester§	297,357	6,732	247	3,608	567	219	786	1,440	1,381	1
10	*Cities 50,000-175,000*	*759,484*	*17,906*	*708*	*10,588*	*1,636*	*686*	*2,322*	*4,399*	*3,864*	*3*
11	Albany	114,018	2,294	74	1,786	178	73	251	750	785	..
12	Binghamton§	64,920	1,677	52	934	152	72	224	333	376	1
13	Niagara Falls	51,806	1,550	60	657	145	81	226	293	138	..
14	Schenectady	89,542	1,968	69	956	168	51	219	414	323	..
15	Syracuse§	172,839	4,191	193	2,634	437	176	613	1,100	921	..
16	Troy	71,766	1,385	74	1,222	142	63	205	507	510	..
17	Utica§	93,368	2,442	94	1,246	202	89	291	492	462	1
18	Yonkers	101,225	2,399	87	1,153	212	81	293	510	349	1
19	*IIIa Cities 20,000-50,000*	*513,826*	*11,539*	*468*	*7,480*	*1,014*	*351*	*1,365*	*2,991*	*3,118*	*6*
20	Amsterdam	33,640	835	29	414	72	18	90	165	159	..
21	Auburn§	35,057	764	26	580	81	47	128	235	217	..
22	Cohoes	22,899	422	24	329	44	16	60	135	133	1
23	Elmira§	44,953	1,168	47	581	84	21	105	202	274	..
24	Gloversville	22,149	443	16	397	39	10	49	158	190	..
25	Jamestown	39,309	813	29	538	70	22	92	208	237	1
26	Kingston	26,728	496	20	450	40	18	58	191	201	..
27	Lockport	21,480	417	14	290	43	15	58	94	138	..
28	Mount Vernon	43,334	956	34	524	78	52	130	186	207	1
29	Newburgh	30,498	675	29	498	62	10	72	238	188	..
30	New Rochelle	36,591	673	37	401	44	16	60	192	149	..
31	Olean	20,803	544	23	306	47	15	62	141	103	..
32	Oswego	23,639	565	16	284	42	15	57	87	139	1
33	Poughkeepsie	35,364	813	31	516	78	22	100	181	235	..
34	Rome§	24,629	691	35	489	71	22	93	186	210	..
35	Watertown	31,519	787	44	616	88	18	106	257	252	1
36	White Plains	21,234	477	14	267	31	14	45	135	86	1

For footnotes, see next page.

Table 13 — NEW YORK STATE CITIES: *Deaths classified by broad age groups and important causes; also by groups of cities for total rural and urban areas outside of New York City*: 1920 — (Continued)

Line No.	CITIES	Estimated population * 1920	Total births (stillbirths excluded)	Stillbirths	Total deaths (stillbirths excluded)	Age in Years: Under 1	1–4	Total under 5 years	5–59	60 years and over	Unknown
37	*IIIb Cities 10,000-20,000*	*373,275*	*8,955*	*378*	*5,693*	*813*	*291*	*1,104*	*2,152*	*2,430*	7
38	Batavia	13,640	348	16	247	33	18	51	90	106	..
39	Beacon§	10,099	206	5	169	24	11	35	54	79	1
40	Corning	15,928	427	13	242	27	7	34	99	109	..
41	Cortland	13,386	290	19	231	19	8	27	73	131	..
42	Dunkirk	19,445	567	19	248	51	11	62	100	86	..
43	Fulton	13,175	316	15	176	38	18	46	54	76	..
44	Geneva	14,761	378	15	235	47	11	58	83	94	..
45	Glens Falls	16,710	401	21	274	33	6	39	95	140	..
46	Hornell	15,097	295	9	221	18	6	24	91	106	..
47	Hudson§	11,404	316	11	203	22	8	30	70	101	2
48	Ithaca	17,117	350	12	274	33	11	44	88	142	..
49	Johnstown	10,932	184	3	141	16	5	21	36	84	..
50	Lackawanna§	17,861	613	17	194	72	36	108	71	13	2
51	Little Falls	13,068	352	9	170	30	11	41	66	62	1
52	Middletown§	16,346	310	26	275	25	11	36	100	139	..
53	North Tonawanda	15,663	414	16	191	38	13	51	90	50	..
54	Ogdensburg§	12,266	327	16	308	62	15	77	115	116	..
55	Oneida	10,655	296	13	160	22	3	25	62	73	..
56	Oneonta	11,690	254	14	188	13	5	18	85	85	..
57	*Peekskill, village*	15,900	335	15	226	30	8	38	87	101	..
58	Plattsburg	10,897	289	18	233	25	13	38	98	97	..
59	*Port Chester, village*	16,767	545	20	208	36	16	52	94	61	1
60	Port Jervis	10,202	249	7	202	23	8	31	100	71	..
61	Rensselaer	10,829	101	10	114	10	1	11	44	59	..
62	Saratoga Spgs.	13,154	273	21	251	22	7	29	90	132	..
63	Tonawanda	10,159	222	9	101	25	7	32	35	34	..
64	Watervliet	16,124	295	9	211	29	17	46	82	83	..
65	*IIIc Cities under 10,000*	*53,548*	*1,291*	*59*	*765*	*80*	*53*	*133*	*298*	*334*	..
66	Canandaigua	7,363	216	8	176	8	5	13	54	109	..
67	Glen Cove	8,757	233	9	80	20	2	22	26	32	..
68	Mechanicville	8,245	194	10	107	12	21	33	38	36	..
69	Norwich	8,311	179	11	135	9	8	17	53	65	..
70	*Ossining, village*§	9,645	228	9	132	13	6	19	67	46	..
71	Salamanca	9,428	219	9	131	18	11	29	59	43	..
72	Sherrill‡	1,799	22	3	4	......	......	......	1	3	..

* Population estimates based upon the average annual increase or decrease between the United States Censuses of 1910 and 1920.

§ Important State Institutions and certain other large institutions, whose inmates are mainly nonresidents, have been constituted separate registration districts, and the populations, births and deaths in the individual cities and areas indicated above are exclusive of the population, births and deaths in these institutions.

‡ Special charter.

Table 13 — NEW YORK STATE CITIES: *Deaths classified by broad age groups and of New York City*

Line No.	CITY	Total deaths all causes (stillbirths excluded)	CAUSES — GENERAL DISEASES: Typhoid fever 1	Smallpox 5	Measles 6	Scarlet fever 7	Whooping cough 8	Diphtheria 9	Influenza 10	TUBERCULOSIS: Total (all forms) (28–35)	Pulmonary 28–29	Tuberculous meningitis 30	Other forms 31–35
1	**NEW YORK STATE**	144,460	371	1	1,101	450	1,007	1,904	5,890	12,543	11,030	814	699
2	**New York City**	73,249	137	..	736	220	615	1,045	3,492	7,135	6,269	509	357
3	**Rest of State**	71,217	234	1	365	230	392	859	2,398	5,408	4,761	305	342
4	**Cities**	35,383	121	..	257	146	221	652	1,155	2,299	1,905	185	209
5	**Rural**	32,490	110	1	95	83	170	197	1,195	2,580	2,349	116	115
6	**Institutional districts**	3,344	3	..	13	1	1	10	48	529	507	4	18
7	*I Cities over 175,000*	*10,857*	*29*	..	*71*	*50*	*63*	*387*	*243*	*755*	*658*	*57*	*40*
8	Buffalo	7,249	26	..	41	22	44	305	180	534	472	35	27
9	Rochester	3,608	3	..	30	28	19	82	63	221	186	22	13
10	*II Cities 50,000–175,000*	*10,588*	*34*	..	*90*	*37*	*57*	*128*	*341*	*710*	*560*	*69*	*81*
11	Albany	1,786	4	..	2	2	6	12	41	164	135	16	13
12	Binghamton	934	7	..	18	4	8	6	56	34	31	2	1
13	Niagara Falls	657	4	..	21	5	6	22	22	40	26	4	10
14	Schenectady	956	7	..	9	2	5	7	46	58	53	3	2
15	Syracuse	2,634	7	..	22	16	9	31	52	118	81	13	24
16	Troy	1,222	4	..	4	3	7	6	48	75	56	8	11
17	Utica	1,246	1	..	5	2	4	19	48	78	57	12	9
18	Yonkers	1,153	...	..	9	3	12	25	28	143	121	11	11
19	*IIIa Cities 20,000–50,000*	*7,480*	*35*	..	*52*	*16*	*66*	*69*	*286*	*488*	*402*	*34*	*52*
20	Amsterdam	414	2	..	.....	...	2	5	20	30	20	3	7
21	Auburn	580	5	..	4	1	15	17	12	45	34	4	7
22	Cohoes	329	...	..	5	1	1	3	12	27	25	1	1
23	Elmira	581	3	..	4	...	4	2	15	21	20	....	1
24	Gloversville	397	2	..	.....	...	1	2	33	16	13	2	1
25	Jamestown	538	3	..	2	...	3	2	43	28	26	1	1
26	Kingston	450	3	..	1	...	2	5	11	42	38	....	4
27	Lockport	290	1	..	.....	...	2	2	11	13	10	1	2
28	Mount Vernon	524	...	..	14	...	6	5	32	31	23	3	5
29	Newburgh	498	3	..	.....	...	4	3	3	57	52	2	3
30	New Rochelle	401	...	..	2	2	1	2	11	20	17	2	1
31	Olean	306	1	..	6	...	2	5	5	14	7	3	4
32	Oswego	284	1	..	7	...	1	2	.....	7	6	1	...
33	Poughkeepsie	516	2	..	1	1	9	3	20	24	20	1	3
34	Rome	489	2	..	4	...	6	5	23	54	46	5	3
35	Watertown	616	6	..	1	8	6	5	25	37	30	3	4
36	White Plains	267	1	..	1	3	1	1	10	22	15	2	5

important causes; also by groups of cities and for total rural and urban areas outside **1920 — (Continued)**

OF DEATH

		DISEASES OF THE NERVOUS SYSTEM			DISEASES OF THE CIRCULATORY SYSTEM		DISEASES OF THE RESPIRATORY SYSTEM				DISEASES OF THE DIGESTIVE SYSTEM			
								PNEUMONIA						
Cancer 39–45	Diabetes 50	Cerebrospinal meningitis 61 b, c	Acute anterior poliomyelitis 63a	Apoplexy and cerebral hemorrhage 64	Organic heart disease 79	Arteriosclerosis 81	Bronchitis 89–90	Total (all forms) 91, 92	Broncho 91	Lobar and unqualified 92	Diarrhea and enteritis (under 2 years 104)	Appendicitis 108	Hernia and intestinal obstruction 109	Cirrhosis of the liver 113
10,539	2,188	190	50	6,852	21,696	4,833	1,759	16,475	7,568	8,907	4,662	1,406	1,215	779
5,317	1,075	123	40	718	11,342	2,824	918	10,058	4,874	5,184	2,545	792	653	366
5,222	1,113	67	10	6,134	10,354	2,059	841	6,417	2,694	3,723	2,117	614	562	413
2,685	622	47	5	2,587	4,555	728	413	3,535	1,479	2,056	1,388	467	351	206
2,463	481	20	5	3,445	5,236	1,076	405	2,593	1,064	1,529	668	138	188	195
74	10	....	....	102	563	255	23	289	151	138	61	9	23	12
828	*186*	*11*	*1*	*713*	*1,311*	*199*	*115*	*1,033*	*421*	*612*	*611*	*153*	*73*	*67*
494	117	6	....	426	826	134	88	725	291	434	464	103	50	38
334	69	5	1	287	485	65	27	308	130	178	147	55	23	29
772	*177*	*11*	*2*	*741*	*1,396*	*217*	*122*	*1,188*	*544*	*644*	*410*	*127*	*101*	*64*
165	33	3	....	134	271	57	9	172	78	94	22	21	17	6
81	11	....	....	86	107	16	14	83	32	51	28	8	8	6
28	8	....	....	26	48	15	7	78	44	34	43	4	7	4
61	14	2	....	78	104	35	9	74	50	24	47	15	7	8
161	45	4	....	186	369	38	20	389	182	207	132	31	24	17
108	23	....	1	85	180	21	21	121	57	64	29	21	17	7
81	20	2	....	75	188	25	28	132	43	89	54	13	12	6
87	23	....	1	71	129	10	14	139	58	81	55	14	9	10
600	*148*	*14*	*2*	*634*	*1,029*	*147*	*67*	*722*	*277*	*445*	*174*	*82*	*89*	*81*
33	9	1	....	36	46	13	7	26	13	13	15	8	5	4
42	9	1	....	52	77	7	5	66	26	40	16	5	5	1
21	5	2	....	29	43	4	2	46	16	30	14	3	5	1
63	21	3	....	42	70	14	.....	33	18	15	7	8	13	4
35	5	2	....	54	63	9	2	25	7	18	7	1	7	3
45	12	1	....	48	71	10	8	52	13	39	10	2	6	3
29	10	....	....	32	68	6	8	36	15	21	12	4	5	1
13	10	1	....	25	49	8	5	20	8	12	10	2	5	1
39	13	1	....	33	70	10	1	64	30	34	12	7	3	2
33	5	2	1	48	65	8	2	47	12	35	12	6	5	....
40	7	....	....	25	51	9	5	68	42	26	5	5	3	1
24	2	....	....	18	36	2	4	36	13	23	2	7	5	....
25	8	....	1	33	63	6	1	18	8	10	8	1	3	2
42	10	....	....	47	80	21	4	66	19	47	11	4	8	6
34	8	....	....	42	59	6	8	35	13	22	18	4	.....	1
57	4	....	....	54	87	13	2	50	20	30	12	11	10	....
25	10	....	....	16	31	1	3	24	4	30	3	4	1	1

Table 13 — NEW YORK STATE CITIES: *Deaths classified by broad age groups and of New York City:*

Line No.	CITY	Total deaths all causes (stillbirths excluded)	CAUSES — GENERAL DISEASES: Typhoid fever 1	Smallpox 5	Measles 6	Scarlet fever 7	Whooping cough 8	Diphtheria 9	Influenza 10	TUBERCULOSIS: Total (all forms) 28–35	Pulmonary 28–29	Tuberculous meningitis 30	Other forms 31–35
37	*IIIb Cities 10,000–20,000*	*5,693*	*19*	..	*43*	*24*	*28*	*59*	*264*	*300*	*266*	*24*	*20*
38	Batavia	247	1	..	4	3	....	1	21	6	4	1	1
39	Beacon	169	1	..	1	...	6	.....	6	11	8	2	1
40	Corning	242	...	..	.....	...	1	1	15	14	13	....	1
41	Cortland	231	...	..	1	...	1	2	11	14	8	1	5
42	Dunkirk	248	2	..	3	2	1	9	14	9	8	1	...
43	Fulton	176	...	..	8	...	2	3	11	7	6	....	1
44	Geneva	235	...	..	2	4	2	1	12	8	8	....	...
45	Glens Falls	274	2	..	.....	...	1	1	3	21	18	2	1
46	Hornell	221	...	..	.....	...	.....	1	9	18	12	....	1
47	Hudson	203	...	..	2	...	1	1	6	16	13	1	2
48	Ithaca	274	1	..	.....	...	3	.....	12	11	6	1	4
49	Johnstown	141	...	..	.....	1	.....	.....	7	6	4	....	2
50	Lackawanna	194	...	..	12	3	2	3	10	15	12	3	...
51	Little Falls	170	...	..	2	...	2	1	5	3	3	....	...
52	Middletown	275	1	..	1	1	.....	4	21	16	13	1	2
53	North Tonawanda	191	3	..	1	4	1	6	11	18	10	....	3
54	Ogdensburg	308	2	..	.....	4	.....	4	14	7	5	2	...
55	Oneida	160	...	..	1	...	.....	1	5	5	5	....	...
56	Oneonta	188	1	..	.....	1	.....	3	5	2	2	....	...
57	*Peekskill, village*	226	...	..	.....	1	.....	4	11	9	8	....	1
58	Plattsburg	233	1	..	1	...	2	1	5	27	22	3	2
59	*Port Chester, village*	208	1	..	.....	...	3	5	11	13	11	1	1
60	Port Jervis	202	...	..	.....	...	.....	2	16	19	18	....	1
61	Rensselaer	114	...	..	.....	...	.....	.....	4	8	8	....	...
62	Saratoga Springs	251	1	..	.....	...	1	1	5	16	14	1	1
63	Tonawanda	101	2	..	.....	...	.....	2	5	9	9	....	...
64	Watervliet	211	...	..	3	...	.....	2	9	22	18	4	...
65	*IIIc Cities under 10,000*	*765*	*4*	..	*2*	*19*	*6*	*9*	*21*	*26*	*19*	*1*	*6*
66	Canandaigua	176	1	..	.....	1	.....	1	1	5	3	....	2
67	Glen Cove	80	1	..	2	...	.....	.....	2	5	3	1	1
68	Mechanicville	107	1	..	.....	18	.....	.....	3	3	1	....	2
69	Norwich	135	...	..	.....	...	.....	2	8	1	1	....	...
70	*Ossining, village*	132	1	..	.....	...	.....	2	8	8	7	....	1
71	Salamanca	131	...	..	.....	...	6	2	4	4	4	....	...
72	Sherrill‡	4	...	..	.....	...	.....	.....	.....	.....	.....	....	...

important causes; also by groups of cities and for total rural and urban areas outside
1920 — (Continued)

OF DEATH

		DISEASES OF THE NERVOUS SYSTEM			DISEASES OF THE CIRCULATORY SYSTEM		DISEASES OF THE RESPIRATORY SYSTEM				DISEASES OF THE DIGESTIVE SYSTEM			
								PNEUMONIA						
Cancer 39–45	Diabetes 50	Cerebrospinal meningitis 61b, c	Acute anterior poliomyelitis 63a	Apoplexy and cerebral hemorrhage 64	Organic heart disease 79	Arteriosclerosis 81	Bronchitis 89–90	Total (all forms) 91, 92	Broncho 91	Lobar and unqualified 92	Diarrhea and enteritis (under 2 years) 104	Appendicitis 108	Hernia and intestinal obstruction 109	Cirrhosis of the liver 113
424	*96*	*11*	....	*436*	*721*	*154*	*100*	*507*	*204*	*308*	*176*	*91*	*75*	*39*
12	2	1	....	19	27	9	11	16	7	9	4	4	1	1
14	5	1	....	14	30	3	2	16	5	11	1	1	3	1
14	2	....	....	22	27	3	3	25	9	16	1	4	6	....
24	5	....	....	22	29	2	1	26	9	17	3	3	3	1
14	8	....	....	11	30	1	3	17	7	10	8	1	2	3
19	3	....	....	8	28	3	5	18	3	15	9	....	2	....
16	3	....	....	19	31	7	2	22	8	14	16	11	2	....
28	9	....	....	22	40	13	3	22	10	12	6	5	9	3
22	4	....	....	26	36	7	2	13	8	5	1	6	3	3
16	6	....	....	16	25	7	4	10	9	1	5	2	4	4
27	3	2	....	25	31	11	2	23	9	14	7	9	1	....
9	4	....	....	16	23	8	10	12	3	9	3	....	2	....
4	....	....	....	3	6	1	1	33	18	15	24	....	....	1
14	1	....	....	13	22	1	3	11	2	9	11	4	3	2
22	4	1	....	40	39	13	2	16	8	8	1	5	2	5
10	3	....	....	8	16	1	8	16	8	8	6	6	2	....
16	4	4	....	20	32	21	9	26	13	13	14	4	3	2
11	2	....	....	9	35	11	2	15	6	9	5	3	2	....
20	2	....	....	15	21	4	2	25	8	17	1	3	3	....
24	4	....	....	19	30	4	7	18	6	12	8	3	2	1
18	5	....	....	22	27	3	5	7	2	5	8	3	3	3
14	4	1	....	17	15	1	1	23	9	14	4	6	3	....
13	2	1	....	11	22	4	2	18	5	13	8	3	3	5
9	....	....	....	7	17	7	1	13	10	3	4	....	2	1
11	5	....	....	17	37	7	4	29	8	21	....	4	3	3
7	....	....	....	4	16	1	4	8	4	4	10	....	3	....
16	5	....	....	10	29	1	1	29	10	19	8	1	3	....
61	*16*	....	....	*64*	*98*	*11*	*9*	*85*	*33*	*52*	*17*	*9*	*15*	*5*
17	6	....	....	21	17	1	3	17	7	10	1	5	3	2
3	2	....	....	13	13	....	....	11	5	6	4	....	1	....
8	1	....	....	7	12	2	....	9	5	4	2	....	2	1
8	3	....	....	8	24	2	3	17	7	10	3	2	4	1
13	2	....	....	6	17	2	1	18	4	14	4	....	1	1
12	2	....	....	8	15	4	2	12	5	7	3	2	2	....
....	....	....	....	1	....	....	....	1	....	1	....	....	....	....

Table 13 — NEW YORK STATE CITIES: *Deaths classified by broad age groups and of New York City:*

		CAUSE OF						
			THE PUERPERAL STATE		MALFORMATIONS AND DISEASES OF EARLY INFANCY			
Line No.	CITY	Nephritis and Bright's disease 119, 120	Puerperal septicemia 137	Other puerperal affections 134–136, 138–141	Congenital malformations 150	Premature birth 151a	Congenital debility 151b	Other causes peculiar to early infancy 152–153
1	**New York State**	10,481	384	1,040	1,363	4,370	1,382	1,959
2	**New York City**	4,833	174	534	649	2,149	833	1,109
3	**Rest of State**	5,648	210	506	714	2,221	549	850
4	**Cities**	2,876	132	291	389	1,374	290	537
5	**Rural**	2,520	78	214	309	838	256	293
6	**Institutional districts**	252	....	1	16	9	3	20
7	*I Cities over 175,000*	*938*	*39*	*93*	*149*	*481*	*53*	*189*
8	Buffalo	578	27	63	102	303	46	141
9	Rochester	360	12	30	47	178	7	48
10	*II Cities 50,000–175,000*	*827*	*30*	*85*	*96*	*420*	*115*	*151*
11	Albany	197	1	4	18	56	13	22
12	Binghamton	75	4	7	9	35	13	19
13	Niagara Falls	37	6	9	9	43	10	12
14	Schenectady	60	7	8	7	40	16	14
15	Syracuse	176	5	30	11	113	30	32
16	Troy	100	3	5	9	34	17	15
17	Utica	96	3	12	22	53	7	15
18	Yonkers	86	1	10	11	46	9	22
19	*IIIa Cities 20,000–50,000*	*626*	*33*	*65*	*80*	*264*	*63*	*101*
20	Amsterdam	15	1	1	6	17	10	9
21	Auburn	39	....	5	7	22	3	8
22	Cohoes	32	....	....	2	8	2	3
23	Elmira	88	3	7	8	26	5	11
24	Gloversville	37	....	1	6	10	....	3
25	Jamestown	36	3	3	1	13	7	10
26	Kingston	43	1	6	4	10	2	4
27	Lockport	12	1	3	4	12	1	3
28	Mount Vernon	47	6	8	3	22	2	9
29	Newburgh	73	3	4	6	13	1	10
30	New Rochelle	30	4	4	1	19	4	4
31	Olean	21	3	5	3	12	3	4
32	Oswego	25	....	3	5	12	5	3
33	Poughkeepsie	24	1	3	4	21	6	8
34	Rome	47	....	....	5	13	6	5
35	Watertown	36	5	4	10	23	5	5
36	White Plains	21	2	6	5	11	1	5

important causes; also by groups of cities and for total rural and urban areas outside 1920 — (Continued)

DEATH —(*Concluded*)

	EXTERNAL CAUSES							
	Accidents							
Old age	Total accidents 164–181, 185, 186	Drowning 169	Railroad accidents 175a	Automobile accidents 175c	Other accidents	Suicides 155–163	Homicides 182–184	All other causes
838	7,351	726	523	1,439	4,663	1,189	446	17,700
289	3,619	331	89	763	2,436	670	325	7,914
549	3,732	395	434	676	2,227	519	123	9,786
138	1,879	117	217	379	1,166	217	78	4,742
409	1,798	274	216	297	1,011	283	40	4,108
2	55	4	1	....	50	19	5	936
10	*498*	*29*	*65*	*135*	*269*	*78*	*30*	*1,395*
10	341	18	49	101	173	49	25	941
....	157	11	16	34	96	29	5	454
45	*560*	*30*	*49*	*102*	*379*	*67*	*21*	*1,448*
4	75	1	7	13	54	13	1	241
9	49	4	7	9	29	4	1	128
4	62	2	7	9	44	2	2	73
6	54	4	7	13	30	7	6	143
9	155	13	15	26	101	23	7	372
8	51	3	8	11	34	11	1	187
3	64	8	3	9	49	4	1	173
....	50	....	....	12	38	3	2	131
45	*385*	*22*	*38*	*74*	*251*	*35*	*11*	*1,023*
3	27	2	4	5	16	....	1	62
10	25	....	3	6	16	6	....	70
2	11	1	1	1	8	1	....	44
2	24	....	1	5	18	3	....	77
....	19	....	1	4	14	4	1	49
3	22	....	3	4	15	1	3	87
7	23	2	1	2	18	3	....	72
3	23	....	4	4	15	....	1	49
1	22	....	....	5	17	2	1	61
....	18	1	1	1	15	1	1	64
4	26	5	....	5	16	1	1	46
1	26	....	5	4	17	....	1	58
1	9	....	....	1	8	1	1	32
....	25	1	2	7	15	2	....	63
3	33	6	....	6	21	8	....	65
4	41	2	12	10	17	3	....	92
1	11	2	....	4	5	4	....	32

Table 13 — New York State Cities: ***Deaths classified by broad age groups and of New York City:***

Line No.	CITY	Nephritis and Bright's disease 119, 120	The puerperal state: Puerperal septicemia 137	The puerperal state: Other puerperal affections 134–136, 138–141	Malformations and diseases of early infancy: Congenital malformations 150	Malformations and diseases of early infancy: Premature birth 151a	Malformations and diseases of early infancy: Congenital debility 151b	Malformations and diseases of early infancy: Other causes peculiar to early infancy 152–153
								CAUSES OF
37	*IIIb Cities 10,000–20,000*	*421*	*28*	*42*	*60*	*196*	*57*	*81*
38	Batavia	14	2	3	......	11	3	1
39	Beacon	14	3	1	3	4	2	2
40	Corning	26	1	1	2	8	4	5
41	Cortland	15	......	......	1	10	1	2
42	Dunkirk	14	......	......	1	9	4	14
43	Fulton	9	1	1	......	5	1	1
44	Geneva	12	......	1	2	10	4	2
45	Glens Falls	14	......	1	5	6	3	6
46	Hornell	17	1	1	4	5	2	2
47	Hudson	15	2	2	1	11	......	1
48	Ithaca	25	1	2	2	12	2	2
49	Johnstown	18	......	......	......	3	......	1
50	Lackawanna	8	......	2	2	10	3	3
51	Little Falls	10	1	4	1	10	1	4
52	Middletown	23	2	1	2	8	2	1
53	North Tonawanda	4	......	1	3	6	4	1
54	Ogdensburg	23	3	......	12	8	2	8
55	Oneida	3	......	1	......	8	3	2
56	Oneonta	21	2	1	2	4	2	1
57	*Peekskill, village*	19	3	8	4	9	......	4
58	Plattsburg	9	1	2	1	7	3	3
59	*Port Chester, village*	21	2	3	4	9	3	7
60	Port Jervis	12	3	6	3	5	2	2
61	Rensselaer	14	......	1	2	......	......	1
62	Saratoga Springs	35	......	2	1	6	4	2
63	Tonawanda	2	......	2	2	3	......	1
64	Watervliet	24	......	......	......	9	2	2
65	*IIIc Cities under 10,000*	*64*	*2*	*8*	*4*	*13*	*2*	*15*
66	Canandaigua	11	2	2	1	1	......	2
67	Glen Cove	6	......	......	1	2	1	2
68	Mechanicville	9	......	1	1	2	......	3
69	Norwich	15	......	1	......	2	......	......
70	*Ossining, village*	12	......	2	......	2	......	2
71	Salamanca	10	......	2	1	4	1	6
72	Sherrill‡	1	......	......	......	......	......	......

important causes; also by groups of cities and for total rural and urban areas outside 1920 — (Concluded)

DEATH —(*Concluded*)

	EXTERNAL CAUSES							
	Accidents							
Old age	Total accidents 164–181, 185, 186	Drowning 169	Railroad accidents 175a	Automobile accidents 175c	Other accidents	Suicides 155–163	Homicides 182–184	All other causes
34	*384*	*34*	*53*	*58*	*239*	*31*	*14*	*760*
4	18	....	4	1	13	....	2	46
....	4	1	....	....	3	2	1	17
5	20	....	5	6	9	2	....	30
2	12	....	1	2	9	1	....	30
3	23	4	....	3	16	2	1	39
1	7	2	....	1	4	....	....	24
1	18	2	4	4	8	3	1	23
1	9	....	1	1	7	1	....	40
3	11	....	5	1	5	2	1	26
....	12	1	....	4	7	....	1	33
1	15	1	....	3	11	1	....	43
....	4	....	....	....	4	1	....	13
....	31	....	3	4	24	....	1	16
4	18	4	1	1	12	2	1	16
1	15	....	3	3	9	3	....	23
3	27	....	1	3	23	....	....	27
1	16	3	2	1	10	....	....	49
1	14	1	5	2	6	....	1	20
....	16	1	6	2	7	3	....	28
....	15	1	....	4	10	2	....	22
1	24	3	2	4	15	....	....	41
....	13	1	1	3	8	....	1	23
....	14	....	6	2	6	....	1	25
....	1	1	....	....	....	1	....	21
....	15	....	3	3	9	4	1	37
1	4	3	....	....	1	1	....	14
1	8	5	....	....	3	....	1	25
6	*52*	*2*	*12*	*10*	*28*	*6*	*2*	*116*
4	18	....	5	4	9	1	....	32
1	3	1	....	....	2	....	1	6
....	5	....	....	....	5	2	....	15
....	7	....	2	....	5	1	....	27
....	9	....	2	5	2	1	....	19
1	10	1	3	1	5	1	1	16
....	....	....	....	....	....	....	....	1

Table 14 — NEW YORK STATE CITIES: *Typhoid fever deaths and death rates per* 100,000 *population; also for New York State and its large subdivisions:* 1916–1920

(Cities listed in order of death rates, from highest to lowest, for 1920)

CITY	Estimated population 1920**	TYPHOID FEVER 1920 Total deaths	1920 Rate	1919 Total deaths	1919 Rate	1918‡ Total deaths	1918‡ Rate	1917* Total deaths	1917* Rate	1916* Total deaths	1916* Rate
NEW YORK STATE	10,450,716	371	3.5	374	3.6	575	5.6	593	5.9	603	6.1
New York City	5,663,988	137	2.4	121	2.2	196	3.6	229	4.2	215	4.0
Rest of State	4,786,728	234	4.9	253	5.3	379	8.1	364	7.8	388	8.4
Cities	2,506,189	121	4.8	159	6.5	219	9.0	209	8.8	239	10.2
Rural	2,234,675	110	4.9	89	4.0	151	6.8	142	6.3	141	6.3
Institutional districts	45,864	3	......	5	......	9	......	13	......	8	......
Tonawanda	10,159	2	19.7	12	120.3	2	20.4	......	......	2	21.2
North Tonawanda	15,663	3	19.2	17	111.1	4	26.8	2	13.7	5	35.2
Watertown	31,519	6	19.0	4	12.9	7	22.9	3	10.0	6	20.2
Ogdensburg †	12,266	2	16.3	2	16.1	3	23.8	3	23.5	......	......
Auburn †	35,057	5	14.3	5	14.3	6	17.3	2	5.8	5	14.6
Canandaigua	7,376	1	13.6	......	......	1	13.6	1	13.7	3	41.1
Mechanicville	8,245	1	12.1	4	49.5	......	......	4	51.5	1	13.1
Glens Falls	16,710	2	12.0	1	6.0	2	12.2	2	12.3	3	18.6
Glen Cove	8,757	1	11.4	......	......	......	......	......	......	......	......
Kingston	26,728	3	11.2	2	7.5	12	45.2	3	11.3	6	22.7
Binghamton †	64,920	7	10.8	1	1.6	1	1.6	7	11.8	6	10.4
Ossining, village †	9,645	1	10.4	......	......	2	20.7	......	......	1	10.3
Dunkirk	19,445	2	10.3	1	5.2	1	5.3	1	5.3	2	10.8
Beacon †	10,099	1	9.9	......	......	......	......	......	......	1	10.0
Newburgh	30,498	3	9.8	5	16.5	4	13.3	......	......	1	3.4
Plattsburg	10,897	1	9.2	1	9.2	3	27.4	4	36.5	2	18.2
Gloversville	22,149	2	9.0	1	4.5	......	......	1	4.6	1	4.6
Oneonta	11,690	1	8.6	1	8.7	1	8.9	1	9.1	3	27.7
Rome †	24,629	2	8.1	1	4.1	3	12.7	2	8.7	3	13.3
Schenectady	89,542	7	7.8	2	2.3	4	4.6	4	4.7	5	6.0
Niagara Falls	51,806	4	7.7	2	4.0	1	2.1	5	11.0	5	11.5
Jamestown	39,309	3	7.6	1	2.6	1	2.6	2	5.4	3	8.3
Saratoga Springs	13,154	1	7.6	1	7.6	4	30.2	1	7.5	3	22.4
Batavia	13,640	1	7.3	......	......	5	37.8	1	7.7	4	31.1
Elmira †	44,953	3	6.7	4	9.1	8	18.5	5	11.8	4	9.7

Middletown †	16,346	1	6.1	1	6.2	3	19.0	1	6.4	2	13.1
Port Chester, village	16,767	1	6.0	1	6.1						
Amsterdam	33,640	2	5.9							3	9.2
Ithaca	17,117	1	5.8			2	12.0	3	18.3	1	6.2
Poughkeepsie	35,364	2	5.7	1	2.9	3	8.8	3	9.0	2	6.2
Troy	71,766	4	5.6	4	5.5	17	23.4	22	30.0	15	20.3
Buffalo †	508,699	26	5.1	33	6.6	38	7.7	47	9.7	50	10.5
Olean	20,803	1	4.8	2	9.9	1	5.1	1	5.3		
Lockport	21,480	1	4.7	3	14.2	5	24.0	6	29.3	5	24.9
White Plains	21,234	1	4.7	1	4.8	1	4.9				
Oswego	23,639	1	4.2	1	4.2	3	12.7	1	4.2	3	12.7
Syracuse †	172,839	7	4.1	12	7.1	14	8.4	10	6.2	19	12.0
Albany	114,018	4	3.5	9	8.0	12	10.8	13	11.8	9	8.3
Utica †	93,368	1	1.1	1	1.1	7	7.8	11	12.6	9	10.5
Rochester †	297,357	3	1.0	10	3.4	5	1.8	8	2.9	13	4.8
Cohoes	22,899			2	8.7			3	12.8	3	12.7
Corning	15,928			1	6.4	5	32.2	4	26.2	5	33.2
Cortland	13,386			1	7.6	2	15.4	1	7.8	1	7.9
Fulton	13,175					3	23.7			2	16.5
Geneva	14,761					4	28.0	2	14.2	1	7.2
Hornell	15,097									1	6.9
Hudson †	11,404			1	8.8	2	17.6	2	17.7	2	17.7
Johnstown	10,932										
Lackawanna	17,861			2	11.4					1	6.1
Little Falls	13,068			1	7.7	4	31.0	4	31.2	1	7.8
Mount Vernon	43,334					2	4.9	4	10.1	2	5.2
New Rochelle	36,591					2	5.7	1	2.9		
Norwich	8,311			1	12.2	1	12.3				
Oneida	10,655					1	9.8			1	10.3
Peekskill, village	15,900									3	19.2
Port Jervis	10,202					1	9.9				
Rensselaer	10,829							1	9.3	1	9.3
Salamanca	9,428			1	11.0	1	11.3			2	24.4
Sherrill §	1,799										
Watervliet	16,124			1	6.2	3	18.8	1	6.3	5	31.8
Yonkers	101,225			1	1.0	2	2.1	6	6.3	2	2.2

* Rates for 1916–1917 revised by exclusion of deaths in State institutions charged prior to July 1, 1917 to city in which institution was located. ** Population estimates based upon the average annual increase or decrease between the United States censuses of 1910 and 1920. † Important State institutions and certain other large institutions, whose inmates are largely nonresidents of the districts in which the institutions are situated, have constituted separate registration districts since July 1, 1917; the populations and deaths in the individual cities indicated above are exclusive of the populations and deaths in these institutions. ‡ Civilian deaths only, except for New York City. § Special charter.

Table 15 — NEW YORK STATE CITIES: ***Pulmonary tuberculosis deaths and death rates per 100,000 population; also for New York State and its large subdivisions:*** **1916–1920**

(Cities listed in order of death rates, highest to lowest, for 1920)

CITY	Estimated population 1920**	PULMONARY TUBERCULOSIS 28, 29									
		1920		1919		1918‡		1917*		1916*	
		Total deaths	Rate	Total deaths	Rate	Total deaths	Rate	Total deaths	Rate	Total deaths	Rate
NEW YORK STATE	10,450,716	11,030	105.5	12,814	124.2	15,052	147.7	14,795	147.1	14,069	141.7
New York City	5,663,998	6,269	110.7	7,535	135.1	8,973	163.5	9,120	168.9	8,663	163.1
Rest of State	4,786,728	4,761	99.5	5,279	111.3	6,079	129.3	5,675	121.8	5,406	117.2
Cities	2,506,189	1,905	76.0	2,180	88.5	2,745	113.3	2,730	115.0	2,643	113.3
Rural	2,234,675	2,349	105.1	2,527	113.1	2,729	122.2	2,429	108.4	2,318	103.5
Institutional districts	45,864	507	....	572	....	605	....	516	....	445	....
Plattsburg	10,897	22	201.9	17	155.7	14	127.9	12	109.4	8	72.8
Rome †	24,629	46	186.8	70	290.3	106	449.1	85	368.2	69	305.6
Port Jervis	10,202	18	176.4	5	49.3	7	69.5	7	69.9	20	201.0
Newburgh	30,498	52	170.5	64	211.7	58	193.5	85	286.1	71	241.1
Kingston	26,728	38	142.2	56	210.1	56	210.8	53	200.1	51	193.1
Yonkers	101,225	121	119.5	107	107.9	121	124.7	118	124.3	108	116.3
Albany	114,018	135	118.4	165	146.4	208	186.8	212	192.8	221	203.5
Hudson †	11,404	13	114.0	13	114.3	10	88.2	11	97.3	14	124.1
Watervliet	16,124	18	111.6	17	106.1	29	182.2	18	113.8	15	95.5
Cohoes	22,899	25	109.2	36	156.0	38	163.4	36	153.6	41	173.7
Glens Falls	16,710	18	107.7	24	144.9	12	73.1	15	92.1	12	74.4
Saratoga Springs	13,154	14	106.4	15	113.6	19	143.3	11	82.6	27	201.9
Auburn †	35,057	34	97.0	29	83.2	31	89.4	34	98.7	39	113.8
Watertown	31,519	30	95.2	28	90.2	35	114.5	25	83.0	22	74.2
Buffalo	508,699	472	92.8	536	107.2	735	149.5	708	146.5	652	137.4
Tonawanda	10,159	9	88.6	9	90.2	7	71.5	6	62.4	11	116.7
Corning	15,928	13	81.6	11	70.0	6	38.7	15	98.2	19	126.1
Hornell	15,097	12	79.5	11	73.6	5	33.8	10	68.2	10	68.9
Middletown †	16,346	13	79.5	18	112.0	17	107.7	16	103.1	24	157.5
Beacon †	10,099	8	79.2	7	69.5	7	69.7	15	149.6	17	170.0
Troy	71,766	56	78.0	89	123.2	156	214.4	182	248.5	163	221.0
Rensselaer	10,829	8	73.9	4	37.0	9	83.3	10	92.6	8	74.2
Ossining, village †	9,645	7	72.6	9	93.3	3	31.1	11	113.8	12	124.1
White Plains	21,234	15	70.6	18	86.4	17	83.2	13	64.9	20	102.0
Lackawanna †	17,861	12	67.2	8	45.6	9	52.4	21	124.6	11	66.6

Jamestown	39,309	26	66.1	33	85.7	34	90.1	44	119.1	30	82.9
Port Chester, village	16,767	11	65.6	12	73.3	8	50.0	13	83.3	13	85.4
North Tonawanda	15,663	10	63.8	9	58.8	10	66.9	15	102.9	12	84.4
Rochester †	297,357	186	62.6	190	65.4	250	88.0	238	85.8	223	82.3
Utica †	93,368	57	61.0	70	76.6	88	98.5	74	84.7	60	70.3
Cortland	13,386	8	59.8	6	45.4	11	84.5	9	70.1	11	87.0
Amsterdam	33,640	20	59.5	31	92.8	33	99.5	35	106.2	47	143.7
Schenectady	89,542	53	59.2	58	66.0	68	78.8	64	75.6	53	63.9
Gloversville	22,149	13	58.7	14	63.6	23	100.7	14	64.5	9	41.7
Poughkeepsie	35,364	20	56.6	19	54.9	30	88.5	29	87.4	21	64.7
Geneva	14,761	8	54.2	3	20.6	10	69.9	4	28.4	8	57.7
Mount Vernon	43,384	23	53.1	19	45.1	16	39.1	20	50.4	21	54.6
Peekskill, village	15,900	8	50.3	14	88.4	21	133.1	19	121.0	15	95.9
Niagara Falls	51,806	26	50.2	28	56.3	34	71.4	35	76.9	41	94.4
Binghamton	64,920	31	47.8	40	63.4	58	94.7	56	94.3	59	102.5
Oneida	10,655	5	46.9	7	67.1	11	107.9	5	50.2	9	92.4
Syracuse †	172,839	81	46.9	90	53.2	143	86.3	136	83.8	135	85.1
Lockport	21,480	10	46.6	10	47.3	10	48.1	27	132.0	13	64.7
New Rochelle	36,501	17	46.5	16	44.6	19	54.2	11	32.1	23	68.5
Fulton	13,175	6	45.5	5	38.7	9	71.2	4	32.3	10	82.5
Elmira †	44,958	20	44.5	18	40.8	37	85.7	33	78.0	30	72.4
Salamanca	9,428	4	42.4	3	32.9	6	68.0	6	70.5	5	60.9
Dunkirk	19,445	8	41.1	16	83.2	16	84.2	16	85.1	20	107.7
Ogdensburg †	12,266	5	40.8	4	32.2	3	23.8	8	62.6	9	69.5
Canandaigua	7,376	3	40.7	4	54.4	5	68.2	7	95.6	6	82.1
Johnstown	10,932	4	36.6	10	91.9	8	73.8	4	37.1	8	74.5
Ithaca	17,117	6	35.1	9	53.3	8	48.0	9	54.8	13	74.0
Glen Cove	8,757	3	34.3	5	58.3	3	35.8	....	....	....	....
Olean	20,803	7	33.6	10	49.5	12	61.2	4	21.0	14	76.0
Batavia	13,640	4	29.3	10	74.4	12	90.6	9	69.0	19	147.9
Oswego	23,639	6	25.4	25	105.9	12	50.9	25	106.1	14	59.5
Little Falls	13,068	3	23.0	13	100.1	8	62.0	8	62.3	13	101.9
Oneonta	11,690	2	17.1	5	43.6	5	44.4	6	54.3	7	64.6
Mechanicville	8,245	1	12.1	5	61.8	5	63.1	6	77.2	6	78.8
Norwich	8,311	1	12.0	1	12.2	5	61.4	8	99.4	2	25.1
Sherrill §	1,799	....	....	2	116.0	....	....	....	....	....	....

* Rates for 1916–1917 revised by exclusion of deaths in State institutions charged prior to July 1, 1917 to city in which institution was located.

** Population estimates based upon the average annual increase or decrease between the United States censuses of 1910 and 1920.

† Important State institutions and certain other large institutions, whose inmates are largely nonresidents of the districts in which the institutions are situated, have been constituted separate registration districts since July 1, 1917; the populations and deaths in the individual cities and areas indicated above are exclusive of the populations and deaths in these institutions.

‡ Civilian deaths only, except for New York City.

§ Special charter.

Table 16 — New York State Cities and Villages of 2,500 and Over: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county: 1920*

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births ex-cluded)	Ages at Death: Under 1	1 to 4	Total under 5	5 to 9	10 to 14	15 to 19	Total 5 to 19	20 to 29	30 to 39	40 to 49	Total 20 to 49	50 to 59	60 and over	Age not stated
1	**STATE OF NEW YORK**	144,466	20,326	9,258	29,584	3,144	2,038	2,973	8,155	10,603	12,427	13,508	36,538	17,672	52,448	69
2	New York City	73,249	11,340	5,948	17,288	1,831	1,115	1,645	4,591	6,184	7,091	7,820	21,095	9,753	20,522	....
3	Remainder of State	71,217	8,986	3,310	12,296	1,313	923	1,328	3,564	4,419	5,336	5,688	1,543	7,919	31,926	69
4	Cities	35,383	5,479	2,149	7,628	838	519	640	1,997	2,340	2,847	3,020	8,207	4,249	13,285	17
5	Villages	11,901	1,191	446	1,637	182	120	215	517	691	785	822	2,298	1,219	6,218	12
6	Towns	20,589	2,141	691	2,832	277	255	427	959	1,110	1,299	1,356	3,765	1,929	11,068	36
7	Institutional districts	3,344	175	24	199	16	29	46	91	278	405	490	1,173	522	1,355	4
8	ALBANY COUNTY	2,779	305	129	434	42	30	46	118	166	201	232	599	383	1,244	1
9	Albany	1,786	178	73	251	20	22	33	75	107	140	166	413	262	785	....
10	Cohoes	329	44	16	60	7	2	3	12	18	22	30	70	53	133	1
11	Watervliet	211	29	17	46	5	2	.....	7	20	15	15	50	25	83	....
12	Green Island	66	8	7	15	1	.....	.....	1	.....	2	3	5	7	38	....
13	Other villages	48	9	2	11	2	.....	.....	2	3	2	1	6	5	24	....
14	Towns	339	37	14	51	7	4	10	21	18	20	17	55	31	181	....
15	ALLEGANY COUNTY	585	54	12	66	6	4	13	23	40	28	33	101	56	336	3
16	Wellsville	94	8	3	11	.....	1	.....	1	11	9	9	29	15	37	1
17	Other villages	166	14	6	20	3	.....	2	5	7	9	10	26	13	102	....
18	Towns	325	32	3	35	3	3	11	17	22	10	14	46	28	197	2
19	BROOME COUNTY	1,830	254	100	354	35	17	23	75	93	133	151	377	205	816	3
20	Binghamton	934	152	72	224	17	7	11	35	47	72	67	186	112	376	1
21	—Binghamton State Hospital	211	.....	.....	.....	.....	.....	.....	.....	9	19	23	51	32	127	1
22	Endicott	93	30	7	37	3	2	2	7	6	6	9	21	4	24	....
23	Johnson City	156	27	11	38	5	2	6	13	14	12	15	41	15	49	....
24	Union	34	5	1	6	3	1	.....	4	.....	1	2	3	3	18	....
25	Other villages	62	3	.....	3	.....	1	.....	1	2	3	6	11	3	44	....
26	Towns	340	37	9	46	7	4	4	15	15	20	29	64	36	178	1
27	CATTARAUGUS COUNTY	1,028	129	44	173	19	14	22	55	72	54	77	203	103	494	....
28	Olean	306	47	15	62	12	3	7	22	25	25	31	81	38	103	....
29	Salamanca	131	18	11	29	3	2	4	9	11	8	11	30	20	43	....

30	Gowanda*	32	1	3	4	1	1	....	2	1	1	2	4	4	18	....
31	Other villages	183	19	5	24	....	3	1	4	9	6	8	23	12	120	....
32	Towns	376	44	10	54	3	5	10	18	26	14	25	65	29	210	....
33	CAYUGA COUNTY	1,060	112	59	171	23	12	17	52	58	65	72	195	107	535	....
34	Auburn	580	81	47	128	20	11	12	43	38	43	46	127	65	217	....
35	—Auburn State Prison	10	....	....	....	....	....	....	....	5	5	....	10	....	....	....
36	Villages	121	6	3	9	1	....	....	1	2	3	6	11	14	86	....
37	Towns	349	25	9	34	2	1	5	8	13	14	20	47	28	232	....
38	CHAUTAUQUA COUNTY	1,612	185	61	246	33	27	33	93	93	120	102	315	145	811	2
39	Dunkirk	248	51	11	62	15	8	6	29	17	13	14	44	27	86	....
40	Jamestown	538	70	22	92	8	10	11	29	35	53	40	128	51	237	1
41	Falconer	36	2	3	5	....	1	2	3	2	1	4	7	9	12	....
42	Fredonia	52	6	....	6	....	1	2	3	1	....	2	3	6	34	....
43	Silver Creek	32	1	6	7	1	....	....	1	3	....	2	5	3	16	....
44	Westfield	50	4	2	6	....	....	2	2	2	7	1	10	5	27	....
45	Other villages	145	10	3	13	4	3	1	8	6	5	8	19	11	94	....
46	Towns	511	41	14	55	5	4	9	18	27	41	31	99	33	305	1
47	CHEMUNG COUNTY	869	109	22	131	12	9	19	40	43	50	67	160	101	437	....
48	Elmira	581	84	21	105	9	5	10	24	23	33	49	105	73	274	....
49	—Elmira State Reformatory	3	....	....	....	....	....	....	....	3	....	....	3	....	....	....
50	Elmira Heights	33	8	....	8	1	1	1	3	4	2	1	7	8	7	....
51	Other villages	39	2	....	2	....	....	....	....	2	1	3	6	2	29	....
52	Towns	213	15	1	16	2	3	8	13	11	14	14	39	18	127	....
53	CHENANGO COUNTY	597	29	19	48	4	6	7	17	31	25	37	93	55	384	....
54	Norwich	135	9	8	17	3	2	1	6	8	8	14	30	17	65	....
55	Villages	144	5	2	7	1	1	2	4	6	6	7	19	18	96	....
56	Towns	297	15	9	24	....	3	4	7	17	11	16	44	20	202	....
57	—Woman's Relief Corps Home, Oxford	21	....	....	....	....	....	....	....	....	....	....	....	....	21	....
58	CLINTON COUNTY	700	121	39	160	16	12	22	50	47	54	42	143	59	288	....
59	Plattsburg	233	25	13	38	6	3	11	20	14	22	16	52	26	97	....
60	Villages	89	13	6	19	3	1	2	6	8	7	5	20	7	37	....
61	Towns	354	83	20	103	7	8	9	24	17	17	17	51	24	152	....
62	—Clinton Prison	11	....	....	....	....	....	....	....	5	5	1	11	....	....	....
63	—Dannemora State Hospital	13	....	....	....	....	....	....	....	3	3	3	9	2	2	....
64	COLUMBIA COUNTY	638	52	19	71	8	7	8	23	24	38	38	100	65	377	2
65	Hudson	203	22	8	30	4	3	4	11	8	15	12	35	24	101	2
66	—State Training School for Girls, Hudson	3	1	....	1	....	....	2	2	....	....	....	....	....	....	....
67	Chatham	25	3	1	4	....	....	....	....	....	1	2	3	4	14	....
68	Other villages	56	3	3	6	3	1	....	4	3	7	3	13	2	31	....
69	Towns	351	23	7	30	1	3	2	6	13	15	21	49	35	231	....

* Gowanda village is located in two counties, Cattaraugus and Erie. No deaths were reported for that part of the village located in Erie county.

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births ex-cluded)	Ages at Death: Under 1	1 to 4	Total under 5	5 to 9	10 to 14	15 to 19	Total 5 to 19	20 to 29	30 to 39	40 to 49	Total 20 to 49	50 to 59	60 and over	Age not stated
70	CORTLAND COUNTY	480	35	14	49	9	2	8	19	14	32	33	79	46	287	......
71	Cortland	231	19	8	27	7	2	4	13	5	16	16	37	23	131	......
72	Homer	49	1	1	2	2	......	......	2	3	6	......	9	5	31	......
73	Other villages	36	2	......	2	......	......	......	......	......	2	3	5	2	27	......
74	Towns	164	13	5	18	......	......	4	4	6	8	14	28	16	98	......
75	DELAWARE COUNTY	662	52	14	66	4	6	14	24	32	36	38	106	67	398	1
76	Sidney	35	3	......	3	......	1	2	3	2	1	......	3	5	21	......
77	Walton	72	8	......	8	......	......	......	......	4	2	6	12	7	45	......
78	Other villages	147	10	3	13	1	2	4	7	6	6	10	22	19	86	......
79	Towns	408	31	11	42	3	3	8	14	20	27	22	69	36	246	1
80	DUTCHESS COUNTY	1,774	162	60	222	20	22	34	76	108	129	169	406	191	878	1
81	Beacon	169	24	11	35	3	4	6	13	9	6	8	23	18	79	1
82	—Matteawan State Hospital	42	1	......	1	......	......	......	......	5	8	9	22	5	14	......
83	Poughkeepsie	516	78	22	100	11	8	9	28	28	32	42	102	51	235	......
84	Wappingers Falls	41	4	1	5	1	1	1	3	3	1	1	5	5	23	......
85	Other villages	113	5	1	6	......	2	2	4	6	5	10	21	9	73	......
86	Towns	538	50	25	75	5	6	16	27	35	32	37	104	43	289	......
87	—Hudson River State Hospital	355	......	......	......	......	1	......	1	22	45	62	129	60	165	......
88	ERIE COUNTY	9,190	1,797	671	2,468	270	149	165	584	694	729	798	2,221	995	2,917	5
89	Buffalo	7,249	1,369	549	1,918	232	126	135	493	574	604	680	1,858	822	2,158	......
90	—Buffalo State Hospital	226	......	......	......	1	......	......	1	18	32	35	85	46	94	......
91	Lackawanna	194	72	36	108	7	1	3	11	21	16	10	47	13	13	2
92	—Our Lady of Victory Infant Home, Lackawanna	199	166	18	184	3	3	1	7	5	2	......	7	......	1	
93	Tonawanda	101	25	7	32	2	3	2	7	6	6	6	18	10	34	......
94	Depew	52	23	6	29	3	......	5	8	5	1	3	9	2	4	......
95	East Aurora	47	3	......	3	1	1	......	2	3	2	6	11	2	29	......
96	Hamburg	48	......	3	3	......	......	......	......	2	2	2	6	8	31	......
97	Lancaster	58	18	4	22	......	......	2	2	3	1	6	10	7	17	......
98	Kenmore	22	......	......	......	......	1	......	1	......	2	......	2	3	16	......
99	Other villages	174	17	12	29	5	1	4	10	7	14	7	28	10	97	......
100	Towns	750	104	36	140	16	13	13	42	48	43	31	122	58	380	2
101	—Gowanda State Hospital	70	......	......	......	......	......	......	......	2	4	12	18	14	37	1

102	ESSEX COUNTY	545	73	16	89	5	3	12	20	67	56	47	179	46	219	1
103	Villages	191	24	5	29	4	1	6	11	30	22	15	67	15	69	...
104	Towns	342	49	11	60	1	2	3	6	35	31	28	94	31	150	1
105	—Raybrook Hospital for Incipient Tuberculosis	12	...	...	...	...	...	3	3	2	3	4	9	...	...	...
106	FRANKLIN COUNTY	887	127	43	170	15	10	29	54	123	110	79	312	67	264	...
107	Malone	154	20	7	36	6	2	4	12	16	6	14	36	8	62	...
108	Saranac Lake*	222	9	...	9	...	1	12	13	75	63	33	159	14	17	...
109	*Saranac Lake*	291	15	2	17	1	3	16	19	96	76	40	212	20	23	...
110	Other villages	74	19	1	20	...	3	...	3	10	9	6	25	8	18	...
111	Towns	417	70	35	105	9	4	13	26	22	33	27	82	37	167	...
112	FULTON COUNTY	751	72	21	93	12	6	14	32	28	63	46	137	97	392	...
113	Gloversville	397	39	10	49	8	3	5	16	16	35	30	81	61	190	...
114	Johnstown	141	16	5	21	...	...	4	4	4	10	5	19	13	84	...
115	Villages	31	5	1	6	...	...	2	2	1	5	1	7	4	12	...
116	Towns	182	12	5	17	4	3	3	10	7	13	10	30	19	106	...
117	GENESEE COUNTY	559	50	27	77	10	11	9	30	29	29	28	86	58	308	...
118	Batavia	247	33	18	51	2	5	4	11	17	13	17	47	32	106	...
119	Le Roy	50	2	1	3	2	1	1	4	...	2	2	4	4	35	...
120	Other villages	37	4	2	6	1	...	...	1	1	2	2	5	3	22	...
121	Towns	225	11	6	17	5	5	4	14	11	12	7	30	19	145	...
122	GREENE COUNTY	450	34	11	45	1	3	10	14	19	33	34	86	43	259	3
123	Catskill	87	10	2	12	...	...	3	3	2	5	8	15	10	46	1
124	Other villages	74	6	4	10	...	1	2	3	2	3	6	11	8	42	...
125	Towns	289	18	5	23	1	2	5	8	15	25	20	60	25	171	2
126	HAMILTON COUNTY	49	5	1	6	...	1	3	4	3	1	4	8	8	23	...
127	Towns	49	5	1	6	...	1	3	4	3	1	4	8	8	23	...
128	HERKIMER COUNTY	860	116	35	151	18	7	16	41	49	64	59	172	93	402	1
129	Little Falls	170	30	11	41	6	2	3	11	5	20	13	38	17	62	1
130	Dolgeville†	27	1	1	2	...	...	...	...	2	3	3	7	4	14	
131	*Dolgeville*	31	3	1	4	...	...	...	...	3	2	4	9	4	14	...
132	Frankfort	54	14	4	18	...	...	...	...	2	2	4	8	5	23	...
133	Herkimer	187	24	10	34	2	2	1	5	10	9	12	31	13	54	...
134	Ilion	127	13	3	16	4	1	4	9	8	6	7	21	15	66	...
135	Mohawk	41	6	...	6	...	...	1	1	...	5	1	6	5	23	...
136	Other villages	55	3	...	3	2	...	1	3	7	5	4	16	5	28	...
137	Towns	249	25	6	31	4	8	6	12	15	15	15	45	20	132	...

* Saranac Lake village is located in two counties, Essex and Franklin. This total represents that part of the village located in Franklin county. The total for the entire village is shown in black face type.

† Dolgeville village located in two counties, Fulton and Herkimer. This total represents that part of the village located in Herkimer county. The total for he entire village is shown in black face type.

Table 16 — New York State Cities and Villages of 2,500 and Over: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* **1920 — (Continued)**

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births ex-cluded)	Ages at Death: Under 1	1 to 4	Total under 5	5 to 9	10 to 14	15 to 19	Total 5 to 19	20 to 29	30 to 39	40 to 49	Total 20 to 49	50 to 59	60 and over	Age not stated
138	Jefferson County	1,355	161	41	202	32	22	25	79	62	85	88	235	146	689	4
139	Watertown	616	88	18	106	22	10	8	40	43	58	51	152	65	252	1
140	Carthage	58	15	5	20	1	1	1	3	1	2	3	6	6	23	.....
141	Other villages	267	16	9	25	3	2	4	9	8	14	14	36	27	169	1
142	Towns	414	42	9	51	6	9	12	27	10	11	20	41	48	245	2
143	Lewis County	340	36	4	40	1	6	4	11	16	17	15	48	36	205	.....
144	Lowville	52	5	.....	5	.....	.....	1	1	4	1	.....	5	5	36	.....
145	Other villages	74	7	2	9	.....	2	1	3	2	4	3	9	9	44	.....
146	Towns	214	24	2	26	1	4	2	7	10	12	12	34	22	125	.....
147	Livingston County	597	45	16	61	16	11	23	50	47	55	51	153	54	277	2
148	Avon	27	3	1	4	.....	1	.....	1	1	3	4	8	2	12	.....
149	Dansville	72	7	1	8	1	1	.....	2	6	4	2	12	9	40	1
150	Mount Morris	44	5	6	11	5	.....	1	6	2	6	2	10	4	13	.....
151	Other villages	126	12	1	13	1	.....	.....	1	2	5	10	17	12	83	.....
152	Towns	215	18	7	25	8	2	6	16	7	12	18	37	14	122	1
153	—Craig Colony, Sonyea	113	.....	.....	.....	1	7	16	24	29	25	15	69	18	7	.....
154	Madison County	629	61	16	77	11	5	10	26	25	36	28	89	68	369	.....
155	Oneida	160	22	3	25	6	5	3	14	6	10	7	23	25	73	.....
156	Canastota	71	8	3	11	2	.....	.....	2	4	4	6	14	10	34	.....
157	Other villages	106	4	2	6	1	.....	3	4	2	7	3	12	12	72	.....
158	Towns	292	27	8	35	2	.....	4	6	13	15	12	40	21	190	.....
159	Monroe County	4,538	625	240	865	101	60	79	240	251	341	377	969	572	1,889	3
160	Rochester	3,608	567	219	786	94	52	60	206	195	275	294	764	470	1,331	1
161	—Rochester State Hospital	159	.....	.....	.....	.....	.....	.....	.....	4	16	21	41	21	97	.....
162	Brockport	48	3	1	4	.....	.....	.....	.....	1	2	2	5	3	36	.....
163	East Rochester	26	3	1	4	.....	1	1	2	2	1	1	4	5	11	.....

164	Fairport	44	6	4	10	.....	.....	.....	.....	.....	2	2	4	3	27	.....
165	Other villages	100	4	5	9	1	1	2	4	4	5	5	14	11	62	.....
166	Towns	553	42	10	52	6	6	16	28	45	40	52	137	59	275	2
167	MONTGOMERY COUNTY	794	107	23	130	11	18	18	37	46	53	54	153	95	379	.....
168	Amsterdam	414	72	18	90	10	9	10	29	31	28	33	92	44	159	.....
169	Fort Plain	48	5	.....	5	.....	.....	.....	.....	1	6	4	11	5	27	.....
170	Other villages	150	15	3	18	.....	1	1	2	8	8	5	21	29	80	.....
171	Towns	182	15	2	17	1	3	2	6	6	11	12	29	17	113	.....
172	NASSAU COUNTY	1,343	195	90	285	35	25	29	89	69	111	106	286	147	534	2
173	Glen Cove	80	20	2	22	3	1	1	5	4	6	5	15	6	32	.....
174	Cedarhurst	19	.....	.....	.....	.....	.....	1	1	3	.....	3	6	4	8	.....
175	Freeport	91	12	2	14	.....	2	1	3	5	6	12	23	7	43	1
176	Lawrence	16	2	1	3	.....	1	.....	1	1	2	3	6	2	4	.....
177	Hempstead	65	6	4	10	1	.....	1	2	1	2	6	9	10	34	.....
178	Lynbrook	50	2	8	10	1	.....	3	4	.....	4	5	9	4	23	.....
179	Rockville Center	63	7	.....	7	2	1	2	5	3	7	3	13	9	29	.....
180	Mineola	134	13	9	22	3	5	3	11	11	18	16	45	20	35	1
181	Other villages	111	9	8	17	4	.....	2	6	5	9	7	21	14	53	.....
182	Towns	714	124	56	180	21	15	15	51	36	57	46	139	71	273	.....
183	NIAGARA COUNTY	1,569	272	130	402	46	21	32	99	110	129	122	361	160	546	1
184	Lockport	290	43	15	58	2	4	7	13	16	16	20	52	29	138	.....
185	Niagara Falls	657	145	81	226	24	10	14	48	56	66	57	179	66	138	.....
186	North Tonawanda	191	38	13	51	10	4	3	17	15	24	15	54	19	50	.....
187	La Salle	38	8	4	12	3	.....	1	4	1	1	2	4	4	14	.....
188	Other villages	55	6	3	9	2	.....	.....	2	4	1	3	8	5	31	.....
189	Towns	338	32	14	46	5	3	7	15	18	21	25	64	37	175	1
190	ONEIDA COUNTY	2,339	372	150	522	58	38	51	147	181	220	217	618	312	1,239	1
191	Rome	489	71	22	93	8	8	13	29	30	30	43	103	54	210	.....
192	—Rome Custodial Asylum	79	4	5	9	8	8	8	24	27	10	6	43	2	1	.....
193	Utica	1,246	202	89	291	32	10	11	53	70	107	105	282	157	462	1
194	—Utica State Hospital	138	.....	.....	.....	.....	.....	.....	.....	9	14	19	42	19	77	.....
195	Sherrill	4	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	3	.....
196	Whitesboro	40	6	.....	6	.....	.....	.....	.....	2	1	1	4	7	23	.....
197	Other villages	224	13	7	20	3	2	3	8	7	10	17	34	18	144	.....
198	Towns	619	76	27	103	7	10	16	33	36	47	26	109	55	319	.....
199	ONONDAGA COUNTY	3,619	532	216	748	70	48	56	169	243	326	307	876	404	1,422	.....
200	Syracuse	2,634	437	176	613	49	30	42	121	187	247	237	671	308	921	.....
201	—State Institution for Feeble Minded, Syracuse	9	.....	.....	.....	.....	.....	1	1	6	.....	.....	6	1	1	.....
202	Baldwinsville	44	5	3	8	1	1	.....	2	1	4	1	6	4	24	.....
203	East Syracuse	34	8	3	11	.....	.....	.....	.....	1	2	3	6	.....	17	.....
204	Solvay	59	15	6	21	2	.....	1	3	2	6	5	18	4	18	.....
205	Other villages	156	12	7	19	3	3	1	7	5	11	9	25	19	86	.....
206	Towns	683	55	21	76	15	9	11	35	41	56	52	149	68	355	.....

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county: 1920* — (Continued)

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births excluded)	Ages at Death: Under 1	1 to 4	Total under 5	5 to 9	10 to 14	15 to 19	Total 5 to 19	20 to 29	30 to 39	40 to 49	Total 20 to 49	50 to 59	60 and over	Age not stated
207	ONTARIO COUNTY	871	91	23	114	8	12	19	39	41	58	53	152	83	482	1
208	Canandaigua	176	8	5	13	1	2	2	5	9	8	15	32	17	109	....
209	Geneva	235	47	11	58	4	5	4	13	19	18	16	53	17	94	....
210	Villages	169	11	1	12	2	....	4	6	7	16	9	32	25	94	....
211	Towns	291	25	6	31	1	5	9	15	6	16	13	35	23	186	1
212	ORANGE COUNTY	1,929	213	64	277	26	26	55	107	145	164	174	483	225	834	3
213	Middletown	275	25	11	36	2	5	1	8	19	29	14	62	30	139	....
214	—Middletown State Hospital	141	1	....	1	....	....	....	....	2	7	22	31	40	69	....
215	Newburgh	498	62	10	72	7	6	18	31	42	44	51	137	70	188	....
216	Port Jervis	202	23	8	31	3	4	7	14	23	22	23	68	18	71	....
217	Goshen	51	8	2	10	1	....	2	3	2	6	2	10	2	26	....
218	Highland Falls	25	2	2	4	....	3	1	4	2	1	2	5	5	7	....
219	Walden	48	5	2	7	1	....	1	2	....	2	5	7	6	25	1
220	Other villages	131	15	6	21	1	....	3	4	5	10	12	27	8	70	1
221	Towns	558	72	23	95	11	8	22	41	50	43	43	136	46	239	1
222	ORLEANS COUNTY	414	35	18	53	8	8	7	23	15	15	24	54	41	243	....
223	Albion	94	8	6	14	3	3	4	10	4	6	7	17	4	49	....
224	Medina	85	7	6	13	2	1	1	4	3	3	4	10	10	48	....
225	Other villages	30	3	....	3	1	....	....	1	1	....	2	3	3	20	....
226	Towns	205	17	6	23	2	4	2	8	7	6	11	24	24	126	....
227	OSWEGO COUNTY	1,055	121	46	167	14	11	11	36	39	61	64	164	95	591	2
228	Fulton	176	28	18	46	2	1	1	4	7	12	16	35	15	76	....
229	Oswego	294	42	15	57	4	4	5	13	9	17	19	45	30	139	1
230	Villages	158	8	3	11	3	....	1	4	2	6	10	18	10	115	....
231	Towns	427	43	10	53	5	6	5	16	21	26	19	66	40	261	1

232	OTSEGO COUNTY	722	49	15	64	12	11	12	35	31	49	47	127	77	417	2
233	Oneonta	188	13	5	18	7	3	6	16	13	20	13	46	23	85	
234	Cooperstown	43	3	2	5	2	2	1	5	2	3	3	8	2	23	
235	Other villages	112	8	2	10		2		9	4	6	4	14	16	69	1
236	Towns	379	25	6	31	3	4	5	12	12	20	27	50	36	240	1
237	PUTNAM COUNTY	170	9	5	14	1	2	1	4	2	14	15	31	10	111	
238	Villages	47	2	1	3	1			1	2	3	6	11	5	27	
239	Towns	123	7	4	11		2	1	3		11	9	20	5	84	
240	RENSSELAER COUNTY	1,851	180	74	254	22	23	31	76	106	130	158	394	260	857	1
241	Rensselaer	114	10	1	11	2	1	3	6	4	12	8	24	14	59	
242	Troy	1,222	142	63	205	17	17	22	56	73	80	110	263	188	510	
243	Hoosick Falls	76	1	5	6	1			1	4	7	4	16	12	42	
244	Other villages	56	1	1	2					2	2	4	8	6	40	
245	Towns	383	26	4	30	2	5	6	13	25	29	30	84	49	206	1
246	ROCKLAND COUNTY	674	77	32	109	14	26	24	64	39	54	44	137	76	288	
247	Haverstraw	50	3	5	8			2	2	4	5	5	14	4	22	
248	Nyack	106	8	7	15	2	3	6	11	6	14	10	30	11	39	
249	Spring Valley	27	4	1	5		2	1	3	2	1	1	4	3	12	
250	Suffern	48	10		10		3		3	1	2	1	4	7	24	
251	Other villages	95	14	3	17	1	1	3	5	4	6	4	14	18	41	
252	Towns	328	37	15	52	8	8	9	26	21	22	26	66	30	150	
253	—Letchworth Village, Thiells	18	1	1	2	2	4	3	9	1	3		4	3		
254	—Hospital for Crippled and Deformed Children, West Haverstraw	7				1	5		6		1		1			
255	ST. LAWRENCE COUNTY	1,597	230	53	283	22	24	20	67	84	95	113	282	144	710	2
256	Ogdensburg	369	62	15	77	12	6	2	20	20	21	23	64	31	116	
257	—St. Lawrence State Hospital	160								6	17	28	51	37	21	
258	Canton	42	2		2	1		1	2	2	2	1	5	5	28	
259	Gouverneur	61	5		5		1	1	2	1	4	2	7	3	44	
260	Massena	88	26	6	32	1		3	4	1	5	2	21	5	26	
261	Potsdam	60	4	2	6	2	2	1	5	1	3	5	9	3	37	
262	Other villages	79	13		13			1	1	2		5	7	7	51	
263	Towns	709	127	30	157	7	15	11	33	33	43	47	128	63	336	2
264	SARATOGA COUNTY	916	92	49	141	15	7	11	33	51	70	70	191	106	444	1
265	Saratoga Springs	251	22	7	29	1	4	2	7	15	21	17	53	30	132	
266	Mechanicville	107	12	21	33	9	1	1	11	4	6	4	14	13	36	
267	Ballston Spa	66	10		10			1	1	2	3	8	13	4	38	
268	Waterford	59	9	4	13					3	7	5	15	5	26	
269	Other villages	103	9	5	14			1	1	6	9	8	23	19	45	
270	Towns	330	30	12	42	5	2	6	13	21	24	28	73	35	166	1

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county*: 1920 — (Continued)

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births ex-cluded)	Ages at Death													
			Under 1	1 to 4	Total under 5	5 to 9	10 to 14	15 to 19	Total 5 to 19	20 to 29	30 to 39	40 to 49	Total 20 to 49	50 to 59	60 and over	Age not stated
271	SCHENECTADY COUNTY	1,199	193	58	251	16	15	28	59	86	105	131	322	146	420	1
272	Schenectady	956	168	51	219	11	12	22	45	61	77	102	240	129	323	......
273	Scotia	34	3	2	5	4	......	1	5	5	1	2	8	3	13	......
274	Towns	209	22	5	27	1	3	5	9	20	27	27	74	14	84	1
275	SCHOHARIE COUNTY	350	26	5	31	1	3	3	7	19	12	13	44	35	232	1
276	Villages	67	4	1	5	......	......	1	1	3	1	3	7	11	43	......
277	Towns	283	22	4	26	1	3	2	6	16	11	10	37	24	189	1
278	SCHUYLER COUNTY	232	14	4	18	3	1	4	8	9	7	13	29	29	157	......
279	Watkins	58	4	1	5	1	......	1	2	3	1	3	7	5	39	......
280	Other villages	42	6	......	6	......	1	......	1	3	......	4	7	2	26	......
281	Towns	132	4	3	7	2	......	3	5	3	6	6	15	13	92	......
282	SENECA COUNTY	638	34	11	45	6	5	6	17	23	39	50	117	88	369	2
283	Seneca Falls	125	10	5	15	2	2	4	8	8	6	6	20	7	75	......
284	Waterloo	71	7	2	9	1	2	1	4	1	3	4	8	5	45	......
285	Other villages	18	1	1	2	1	......	......	1	......	......	......	......	3	11	1
286	Towns	134	15	3	18	2	1	1	4	2	4	5	11	13	87	1
287	—Willard State Hospital	290	1	......	1	......	......	......	......	17	26	35	78	60	151	......
288	STEUBEN COUNTY	1,437	110	35	145	12	13	21	46	60	78	84	222	156	867	1
289	Corning	242	27	7	34	2	5	6	13	13	26	18	57	29	109	......
290	Hornell	221	18	6	24	1	3	3	7	19	15	20	54	30	106	......
291	Bath	100	9	1	10	......	......	2	2	5	8	10	23	14	51	......
292	Other villages	208	12	6	18	2	1	2	5	7	10	8	25	20	140	......
293	Towns	498	44	15	59	7	4	8	19	16	19	27	62	62	295	1
294	—Soldiers' and Sailors' Home	168	......	......	......	......	......	......	......	......	......	1	1	1	166	......
295	SUFFOLK COUNTY	2,241	164	54	218	29	19	48	96	147	246	297	690	332	903	2
296	Amityville	90	3	3	6	2	1	4	7	1	2	10	13	10	54	......
297	Babylon	48	5	......	5	1	1	1	3	2	2	3	7	9	24	......

298	Greenport	55	4	5	9	2	1	1	4		3	5	8	9	25	
299	Patchogue	55	5	4	9	1		2	3	6	4	3	13	4	26	
300	Sag Harbor	36	5	1	6	1		1	2	2	3		5	3	20	
301	Southampton	77	13	3	16			2	2	10	4	9	23	13	23	
302	Other villages	39	2		2		1	1	2	3	2	2	7	5	23	
303	Towns	988	127	38	165	22	14	29	65	41	73	73	187	105	466	
304	—Central Islip State Hospital	559					1	5	6	60	102	125	287	110	154	2
305	—Kings Park State Hospital	294						2	2	22	51	67	140	64	88	
306	SULLIVAN COUNTY	625	31	14	45	5	6	22	33	102	84	67	253	68	225	1
307	Villages	182	2	4	6	1	3	7	11	47	33	31	111	14	40	
308	Towns	443	29	10	39	4	3	15	22	55	51	36	142	54	185	1
309	TIOGA COUNTY	394	37	7	44	5	2	4	11	7	16	29	52	37	250	
310	Owego	81	5		5	3	2	1	6	1	3	6	10	10	50	
311	Waverly	64	8	1	9						1	8	9	5	41	
312	Other villages	51	4	2	6					1	3	3	7	5	33	
313	Towns	198	20	4	24	2		3	5	5	9	12	26	17	126	
314	TOMPKINS COUNTY	531	53	15	68	2	2	13	17	31	25	28	84	43	319	
315	Ithaca	274	33	11	44		1	9	10	20	15	17	52	26	142	
316	Villages	67	4		4			1	1	3	5		8	3	51	
317	Towns	190	16	4	20	2	1	8	6	8	5	11	24	14	126	
318	ULSTER COUNTY	1,236	110	52	162	15	14	22	51	72	86	122	280	140	601	2
319	Kingston	450	40	18	58	5	6	6	17	26	30	50	106	68	201	
320	Ellenville	60	2	1	3	1		1	2	4	6	5	15	7	33	
321	Saugerties	72	6	2	8	1			1	4	8	11	23	8	32	
322	Other villages	56	3		3	1		1	2	4	1	5	10	5	36	
323	Towns	598	59	31	90	7	8	14	29	34	41	51	126	52	299	2
324	—Eastern New York Reformatory, Napanoch															
325	WARREN COUNTY	503	59	16	75	3	4	1	8	30	27	41	98	54	268	
326	Glens Falls	274	33	6	39	2	1	1	4	17	13	29	59	32	140	
327	Villages	12								1	1		2	2	8	
328	Towns	217	26	10	36	1	3		4	12	13	12	37	20	120	
329	WASHINGTON COUNTY	613	61	21	82	6	3	9	18	32	21	32	85	64	363	1
330	Fort Edward	39	3	2	5	1		1	2	4	2	1	7	5	20	
331	Granville	35	7		7		1		1	1	3	1	5	5	17	
332	Hudson Falls	79	9	2	11	1		1	2	6	2	5	13	10	43	
333	Whitehall	58	6	5	11	2	1	1	4	3		4	7	4	32	
334	Other villages	110	3	1	4	1			1	6	3	4	13	10	82	
335	Towns	291	33	11	44	1	1	5	7	12	11	17	40	30	169	1
336	—Great Meadow Prison, Comstock	1						1	1							

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county: 1920* — (Continued)

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births excluded)	AGES AT DEATH													
			Under 1	1 to 4	Total under 5	5 to 9	10 to 14	15 to 19	Total 5 to 19	20 to 29	30 to 39	40 to 49	Total 20 to 49	50 to 59	60 and over	Age not stated
337	WAYNE COUNTY	695	64	21	85	7	9	9	25	31	38	49	118	67	400	......
338	Clyde	40	8	1	9	......	2	......	2	3	......	......	3	5	21	......
339	Lyons	63	7	1	8	......	2	1	3	1	5	1	7	6	39	......
340	Newark	76	8	3	11	......	1	1	2	5	1	6	12	9	42	......
341	Other villages	105	4	3	7	......	1	......	1	3	3	5	11	15	71	......
342	Towns	402	37	13	50	7	3	6	16	18	26	36	80	30	226	......
343	—Newark State Custodial Asylum	9	......	......	......	......	......	1	1	1	3	1	5	2	1	......
344	WESTCHESTER COUNTY	4,205	584	255	839	105	71	91	267	296	390	376	1,062	502	1,536	9
345	Mt. Vernon	524	78	52	130	15	4	7	26	41	36	27	104	56	207	1
346	New Rochelle	401	44	16	60	8	8	13	29	40	40	29	109	54	149	......
347	Ossining	132	13	6	19	6	3	1	10	9	12	13	34	23	46	......
348	—Sing Sing Prison	22	......	......	......	......	......	3	3	15	3	1	19	......	......	......
349	Peekskill	226	30	8	38	6	6	4	16	13	19	13	45	26	101	......
350	White Plains	267	31	14	45	7	7	8	22	15	28	32	75	38	86	1
351	Port Chester	208	36	16	52	8	4	5	17	20	16	15	51	26	61	1
352	Yonkers	1,153	212	81	293	29	23	22	74	80	115	121	316	120	349	1
353	Bronxville	53	9	2	11	3	......	2	5	3	5	8	16	6	15	......
354	Dobbs Ferry	53	8	4	12	1	3	2	6	2	2	4	8	10	17	......
355	Hastings-on-Hudson	30	10	1	11	1	......	1	2	1	......	2	3	5	9	......
356	Irvington	18	......	1	1	......	......	1	1	1	1	2	4	2	10	......
357	Mamaroneck	61	3	3	6	......	......	1	1	5	5	7	17	9	28	......
358	Mt. Kisco	71	18	7	25	4	......	3	7	1	8	4	13	7	19	......
359	North Tarrytown	59	4	9	13	2	......	2	4	1	4	6	11	4	27	......
360	Pleasantville	28	3	......	3	......	......	......	......	3	2	2	7	1	17	......
361	Rye	45	5	5	10	1	......	1	2	3	4	4	11	3	19	......
362	Tarrytown	71	10	5	15	......	1	2	3	4	7	9	20	4	29	......
363	Scarsdale	17	1	1	2	......	......	......	......	......	5	3	8	2	5	......
364	Tuckahoe	29	8	3	11	......	......	......	......	1	1	3	5	4	9	......
365	Other villages	113	14	3	17	2	1	......	3	4	18	7	29	14	49	1
366	Towns	623	47	18	65	13	11	12	36	34	48	64	146	88	284	4
367	—State Reformatory for Women, Bedford	1	......	......	......	......	......	......	......	......	1	......	1	......	......	......

368	WYOMING COUNTY	431	43	8	51	8	4	9	21	21	28	29	78	37	244	....
369	Perry	66	6	2	8	2	1	3	6	5	3	4	12	4	36	....
370	Warsaw	75	7	3	10	1	1	2	4	3	6	8	17	5	39	....
371	Other villages	88	6	1	7	2	1	2	5	3	5	3	11	11	54	....
372	Towns	202	24	2	26	3	1	2	6	10	14	14	38	17	115	....
373	YATES COUNTY	270	18	12	30	4	......	1	5	10	11	16	37	21	176	1
374	Penn Yan	27	5	6	11	1	......	......	1	5	7	5	17	10	47	1
375	Other villages	32	1	......	1	1	......	......	1	......	1	......	1	1	28	....
376	Towns	151	12	6	18	2	......	1	3	5	3	11	19	10	101	....

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* **1920**

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births excluded)	Causes of Death — General Diseases: Typhoid fever 1	Smallpox 5	Measles 6	Scarlet fever 7	Whooping cough 8	Diphtheria 9	Influenza 10	Tuberculosis: Total all forms 28–35	Tuberculosis: Pulmonary 28, 29	Tuberculosis: Tuberculous meningitis 30	Tuberculosis: Other forms 31–35	Cancer 39–45	Diabetes 50
1	**STATE OF NEW YORK**	144,466	371	1	1,101	450	1,007	1,904	5,890	12,543	11,030	814	699	10,539	2,188
2	**New York City**	73,249	137	....	736	220	615	1,045	3,492	7,135	6,269	509	357	5,317	1,075
3	**Remainder of State**	71,217	234	1	365	230	392	859	2,398	5,408	4,761	305	342	5,222	1,113
4	**Cities**	35,383	121	....	257	146	221	652	1,155	2,299	1,905	185	209	2,685	622
5	**Villages**	11,901	48	1	35	39	59	71	397	939	855	43	41	961	169
6	**Towns**	20,589	62	....	60	44	111	126	798	1,641	1,494	73	74	1,502	312
7	**Institutional districts**	3,344	3	....	13	1	1	10	48	529	507	4	18	74	10
8	ALBANY COUNTY	2,779	6	....	13	3	11	22	68	235	194	25	16	242	49
9	Albany	1,786	4	....	2	2	6	12	41	164	135	16	13	165	33
10	Cohoes	329	....	....	5	1	1	3	12	27	25	1	1	21	5
11	Watervliet	211	....	....	3	....	....	2	9	22	18	4	....	16	5
12	Green Island	66	....	....	....	....	....	....	....	1	1	....	....	6	....
13	Other villages	48	....	....	2	....	2	....	2	3	2	....	1	6	1
14	Towns	339	2	....	1	....	2	5	4	18	13	4	1	28	5
15	ALLEGANY COUNTY	585	3	....	3	2	4	1	50	21	17	2	2	36	7
16	Wellsville	94	....	....	....	....	....	....	9	8	7	....	1	7	1
17	Other villages	166	1	....	....	1	....	....	16	6	4	2	....	14	2
18	Towns	325	2	....	3	1	4	1	25	7	6	....	1	15	4
19	BROOME COUNTY	1,830	7	....	21	6	21	17	100	86	78	5	3	145	27
20	Binghamton	934	7	....	18	4	8	6	56	34	31	2	1	81	11
21	—Binghamton State Hospital	211	....	....	....	....	....	2	6	13	12	....	1	4	....

22	Endicott	93			2		6	2	10	3	2		1	6	2
23	Johnson City	156			1	1	1	3	1	6	4	2		15	5
24	Union	34						1	4					3	
25	Other villages	62				1			2	3	3			11	
26	Towns	340					6	3	21	27	26	1		25	9
27	CATTARAUGUS COUNTY	1,028	1		7	1	14	15	30	53	44	3	6	66	9
28	Olean	306	1		6		2	5	5	14	7	3	4	24	2
29	Salamanca	131					6	2	4	4	4			12	2
30	Gowanda *	32												2	
31	Other villages	183						1	2	7	7			10	1
32	Towns	376			1	1	6	7	19	28	26		2	18	4
33	CAYUGA COUNTY	1,060	10		5	1	17	18	28	59	47	4	8	90	20
34	Auburn	580	5		4	1	15	17	12	45	34	4	7	42	9
35	—Auburn State Prison	10							1	1	1			1	
36	Villages	121	1						1	3	2		1	14	1
37	Towns	349	4		1		2	1	14	10	10			33	10
38	CHAUTAUQUA COUNTY	1,612	7		5	3	6	14	103	69	64	2	3	109	31
39	Dunkirk	248	2		3	2	1	9	14	9	8	1		14	8
40	Jamestown	538	3		2		3	2	43	28	26	1	1	45	12
41	Falconer	36						1	2	4	4			2	
42	Fredonia	52								2	2			5	1
43	Silver Creek	32						1	2	2	2			5	
44	Westfield	50							4	4	3		1	3	
45	Other villages	145							7	5	5			6	3
46	Towns	511	2			1	2	1	31	15	14		1	29	7
47	CHEMUNG COUNTY	869	3		4		5	3	20	52	49		3	88	28
48	Elmira	581	3		4		4	2	15	21	20		1	63	21
49	—Elmira State Reformatory	3								2	2				
50	Elmira Heights	33							2	3	3			3	2
51	Other villages	39								1	1			6	
52	Towns	213					1	1	3	25	23		2	16	5
53	CHENANGO COUNTY	597					2	4	23	21	16	2	3	52	7
54	Norwich	135						3	3	1	1			8	3
55	Villages	144					1		4	5		4	1	20	1
56	Towns	297					1	1	16	15	11	2	2	20	3
	—Women's Relief Corps Home, Oxford	21												4	
58	CLINTON COUNTY	700	2		3	5	2	3	29	69	56	7	6	39	12
59	Plattsburg	233	1		1		2	1	5	27	22	3	2	18	5
60	Villages	89				1			5	8	7	1		4	1
61	Towns	354	1		2	4		2	19	21	15	2	4	17	6
62	—Clinton Prison	11								8	7	1			
63	—Dannemora State Hospital	13								5	5				

* Gowanda village is located in two counties, Cattaraugus and Erie. No deaths were reported for that part located in Erie county.

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births excluded)	CAUSES OF DEATH — GENERAL DISEASES: Typhoid fever 1	Smallpox 5	Measles 6	Scarlet fever 7	Whooping cough 8	Diphtheria 9	Influenza 10	Tuberculosis: Total all forms 28–35	Pulmonary 28, 29	Tuberculous meningitis 30	Other forms 31–35	Cancer 39–45	Diabetes 50
1	STATE OF NEW YORK	144,466	371	1	1,101	450	1,007	1,904	5,890	12,543	11,030	814	699	10,539	2,188
2	New York City	73,249	137	......	736	220	615	1,045	3,492	7,135	6,269	509	357	5,317	1,075
3	Remainder of State	71,217	234	1	365	230	392	859	2,398	5,408	4,761	305	342	5,222	1,113
4	Cities	35,383	121	......	257	146	221	652	1,155	2,299	1,905	185	209	2,685	622
5	Villages	11,901	48	1	35	39	59	71	397	939	855	43	41	961	169
6	Towns	20,589	62	......	60	44	111	126	798	1,641	1,494	73	74	1,502	312
7	Institutional districts	3,344	3	......	13	1	1	10	48	529	507	4	18	74	10
8	ALBANY COUNTY	2,779	6	......	13	3	11	22	68	235	194	25	16	242	49
9	Albany	1,786	4	......	2	2	6	12	41	164	135	16	13	165	33
10	Cohoes	329	......	......	5	1	1	3	12	27	25	1	1	21	5
11	Watervliet	211	......	......	3	......	......	2	9	22	18	4	......	16	5
12	Green Island	66	......	......	......	......	......	......	......	1	1	......	......	6	......
13	Other villages	48	......	......	2	......	2	......	2	3	2	......	1	6	1
14	Towns	339	2	......	1	......	2	5	4	18	13	4	1	28	5
15	ALLEGANY COUNTY	585	3	......	3	2	4	1	50	21	17	2	2	36	7
16	Wellsville	94	......	......	......	......	......	......	9	8	7	......	1	7	1
17	Other villages	166	1	......	......	1	......	......	16	6	4	2	......	14	2
18	Towns	325	2	......	3	1	4	1	25	7	6	......	1	15	4
19	BROOME COUNTY	1,830	7	......	21	6	21	17	100	86	78	5	3	145	27
20	Binghamton	934	7	......	18	4	8	6	56	34	31	2	1	81	11
21	—Binghamton State Hospital	211	......	......	......	......	......	2	6	13	12	......	1	4	......

22	Endicott	93			2		6	2	10	3	2		1	6	2
23	Johnson City	156			1	1	1	3	1	6	4	2		15	5
24	Union	34						1	4					3	
25	Other villages	62				1			2	3	8			11	
26	Towns	340					6	3	21	27	26	1		25	9
27	CATTARAUGUS COUNTY	1,028	1		7	1	14	15	30	53	44	3	6	66	9
28	Olean	306	1		6		2	5	5	14	7	3	4	24	2
29	Salamanca	131					6	2	4	4	4			12	2
30	Gowanda *	32												2	
31	Other villages	183						1	2	7	7			10	1
32	Towns	376			1	1	6	7	19	28	26		2	18	4
33	CAYUGA COUNTY	1,060	10		5	1	17	18	28	59	47	4	8	90	20
34	Auburn	580	5		4	1	15	17	12	45	34	4	7	42	9
35	—Auburn State Prison	10							1	1	1			1	
36	Villages	121	1						1	3	2		1	14	1
37	Towns	349	4		1		2	1	14	10	10			33	10
38	CHAUTAUQUA COUNTY	1,612	7		5	3	6	14	103	69	64	2	3	109	31
39	Dunkirk	248	2		3	2	1	9	14	9	8	1		14	8
40	Jamestown	538	3		2		3	2	43	28	26	1	1	45	12
41	Falconer	36						1	2	4	4			2	
42	Fredonia	52								2	2			5	1
43	Silver Creek	32						1	2	2	2			5	
44	Westfield	50							4	4	3		1	3	
45	Other villages	145							7	5	5			6	3
46	Towns	511	2			1	2	1	31	15	14		1	29	7
47	CHEMUNG COUNTY	869	3		4		5	3	20	52	49		3	88	28
48	Elmira	581	3		4		4	2	15	21	20		1	63	21
49	—Elmira State Reformatory	3								2	2				
50	Elmira Heights	33							2	3	3			3	2
51	Other villages	39								1	1			6	
52	Towns	213					1	1	3	25	23		2	16	5
53	CHENANGO COUNTY	597					2	4	23	21	16	2	3	52	7
54	Norwich	135						3	3	1	1			8	3
55	Villages	144					1		4	5		4	1	20	1
56	Towns	297					1	1	16	15	11	2	2	20	3
	—Women's Relief Corps Home, Oxford	21												4	
58	CLINTON COUNTY	700	2		3	5	2	3	29	69	56	7	6	39	12
59	Plattsburg	233	1		1		2	1	5	27	22	3	2	18	5
60	Villages	89				1			5	8	7	1		4	1
61	Towns	354	1		2	4		2	19	21	15	2	4	17	6
62	—Clinton Prison	11								8	7	1			
63	—Dannemora State Hospital	13								5	5				

* Gowanda village is located in two counties, Cattaraugus and Erie. No deaths were reported for that part located in Erie county.

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also total for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births excluded)	Causes of Death — General Diseases: Typhoid fever 1	Smallpox 5	Measles 6	Scarlet fever 7	Whooping cough 8	Diphtheria 9	Influenza 10	Tuberculosis: Total all forms 28–35	Tuberculosis: Pulmonary 28, 29	Tuberculosis: Tuberculous meningitis 30	Tuberculosis: Other forms 31–35	Cancer 39–45	Diabetes 50
64	COLUMBIA COUNTY	638	4	...	6	...	2	3	14	43	35	2	6	52	13
65	Hudson	203	...	...	2	...	1	1	6	16	13	1	2	16	6
66	—State Training School for Girls, Hudson	3	...	...	...	...	...	...	...	2	2	...	...	...	...
67	Chatham	25	...	...	...	...	...	...	...	1	1	...	...	5	1
68	Other villages	56	...	...	1	...	...	...	...	4	4	...	...	7	2
69	Towns	351	4	...	3	...	1	2	8	20	15	1	4	24	4
70	CORTLAND COUNTY	480	2	...	1	1	2	4	22	23	15	2	6	45	10
71	Cortland	231	...	...	1	...	1	2	11	14	8	1	5	24	5
72	Homer	49	2	...	...	...	...	...	2	2	2	...	...	4	1
73	Other villages	36	...	...	...	...	...	...	1	3	2	...	1	5	1
74	Towns	164	...	...	...	1	1	2	8	4	3	1	...	12	3
75	DELAWARE COUNTY	662	1	...	...	3	4	...	34	27	26	...	1	46	8
76	Sidney	35	...	...	...	...	...	...	...	1	1	...	...	2	...
77	Walton	72	...	...	...	...	2	...	2	3	3	...	...	4	2
78	Other villages	147	1	...	...	...	...	...	5	7	7	...	...	13	2
79	Towns	408	...	...	...	3	2	...	27	16	15	...	1	27	4
80	DUTCHESS COUNTY	1,774	4	...	4	1	21	5	54	188	176	3	9	120	26
81	Beacon	169	1	...	1	...	6	...	6	11	8	2	1	14	5
82	—Matteawan State Hospital	42	...	...	...	...	...	...	...	10	9	...	1	4	...
83	Poughkeepsie	516	2	...	1	1	9	3	20	24	20	1	3	42	10
84	Wappingers Falls	41	...	...	...	...	...	...	...	1	1	...	...	8	...

85	Other villages	113			1				2	5	4		1	7	4
86	Towns	538	1		1		6	2	18	66	65		1	38	7
87	—Hudson River State Hospital	355							8	71	69		2	7	
88	ERIE COUNTY	9,190	33		69	29	49	332	238	668	590	47	31	584	150
89	Buffalo	7,249	26		41	22	44	305	180	534	472	35	27	494	117
90	—Buffalo State Hospital	226						2	1	35	33		2	5	1
91	Lackawanna	194			12	3	2	3	10	15	12	3		4	
92	—Our Lady of Victory Infant Home, Lackawanna	199	1		12			4		3	1	2			
93	Tonawanda	101	2					2	5	9	9			7	
94	Depew	52					1	1	2	5	5				
95	East Aurora	47	1						3	3	3			5	
96	Hamburg	48								3	1	2		4	2
97	Lancaster	58				2			1	5	5			1	2
98	Kenmore	22	1											1	1
99	Other villages	174			1	1		1	14	11	8	2	1	9	3
100	Towns	750	2		3	1	2	14	22	38	34	3	1	51	24
101	—Gowanda State Hospital	70								7	7			3	
102	ESSEX COUNTY	545	1		5	2			37	102	95	3	4	30	4
103	Villages	191			1	1			10	59	56	1	2	8	1
104	Towns	342	1		4	1			27	31	27	2	2	22	3
105	—Raybrook Hospital for Incipient Tuberculosis	12								12	12				
106	FRANKLIN COUNTY	867	3		1	3	6	6	29	229	219	6	4	41	8
107	Malone	154				1	2	3	4	10	9	1		6	2
108	Saranac Lake*	222			1				2	183	183			8	1
109	*Saranac Lake*	291			1	1			2	233	233			10	1
110	Other villages	74						1	5	7	7			4	2
111	Towns	417	3			2	4	2	18	29	20	5	4	23	3
112	FULTON COUNTY	751	3			1	4	2	56	36	29	3	4	58	12
113	Gloversville	397	2				1	2	33	16	13	2	1	35	5
114	Johnstown	141				1			7	6	4		2	9	4
115	Villages	31					1		1	3	3			3	
116	Towns	182	1				2		15	11	9	1	1	11	3
117	GENESEE COUNTY	559	2		4	5	1	3	31	22	15	3	4	24	6
118	Batavia	247	1		4	3		1	21	6	4	1	1	12	2
119	Le Roy	50						1	1	2	2			4	1
120	Other villages	37				1									
121	Towns	225	1			1	1	1	9	14	9	2	3	8	3
122	GREENE COUNTY	450	1		3	2	3	2	8	31	39	1	1	47	4
123	Catskill	87	1			1	1		1	5	4	1		8	
124	Other villages	74			3	1	1		2	6	5		1	11	
125	Towns	289					1	2	5	30	30			28	4

* Saranac Lake village is located in two counties, Essex and Franklin. This total represents that part of the village located in Franklin county. The total for the entire village is shown in blackface type.

Table 16 — New York State Cities and Villages of 2,500 and Over: ***Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:*** **1920 — (Continued)**

Line No.	State and subdivisions, by counties	Total deaths all causes (still-births excluded)	Typhoid fever 1	Smallpox 5	Measles 6	Scarlet fever 7	Whooping cough 8	Diphtheria 9	Influenza 10	Tuberculosis: Total all forms 28–35	Tuberculosis: Pulmonary 28, 29	Tuberculosis: Tuberculous meningitis 30	Tuberculosis: Other forms 31–35	Cancer 39–45	Diabetes 50
126	HAMILTON COUNTY	49							1	6	6			4	2
127	Towns	49							1	6	6			4	2
128	HERKIMER COUNTY	860	4		4	2	6	5	29	52	46	2	4	69	11
129	Little Falls	170			2		2	1	5	3	3			14	1
130	Dolgeville†	27			1				2	1	1			2	1
131	*Dolgeville*	**31**			**1**				**2**	**1**	**1**			**2**	**1**
132	Frankfort	54						1	2	3	3			4	1
133	Herkimer	137	1		1	1	2		5	9	6	1	2	9	
134	Ilion	127	1						8	8	8			12	1
135	Mohawk	41				1	1			1	1			1	1
136	Other villages	55	1							8	7		1		1
137	Towns	249	1				1	3	7	19	17	1	1	27	5
138	JEFFERSON COUNTY	1,355	8		2	13	11	8	56	61	50	5	6	118	16
139	Watertown	616	6		1	8	6	5	25	37	30	3	4	57	4
140	Carthage	58				2			6	4	3		1		1
141	Other villages	267	2		1	2	2		11	9	8	1		18	5
142	Towns	414				1	3	3	14	11	9	1	1	43	6
143	LEWIS COUNTY	340		1			2	1	17	10	8		2	29	5
144	Lowville	52							3	1	1			5	
145	Other villages	74		1					4	3	2		1	7	1
146	**Towns**	**214**					**2**	**1**	**10**	**6**	**5**		**1**	**17**	**4**

† Dolgeville, village, is located in two counties, Fulton and Herkimer. This total represents that part of the village located in Herkimer county. The total for the entire village is shown in blackface type.

147	LIVINGSTON COUNTY	597	3		3	1	1	4	20	42	39	1	2	40	9
148	Avon	27			1				1	3	3			3	
149	Dansville	72							1	2	2			7	1
150	Mount Morris	44	1					2	3	2	2			1	
151	Other villages	126			1				5	5	4		1	11	2
152	Towns	215	2		1	1	1	1	9	8	6	1	1	18	6
153	—Craig Colony, Sonyea	113						1	1	22	22				
154	MADISON COUNTY	629	1		1	3		1	25	27	26	1		51	13
155	Oneida	160			1			1	5	5	5			11	2
156	Canastota	71				3			4	3	3			6	2
157	Other villages	106							1	5	5			9	2
158	Towns	292	1						15	14	13	1		25	7
159	MONROE COUNTY	4,538	6		34	28	22	89	84	367	326	25	16	402	76
160	Rochester	3,608	3		30	28	19	82	63	221	186	22	13	334	69
161	—Rochester State Hospital	159								16	15		1	8	
162	Brockport	48							3	2	2			1	1
163	East Rochester	26						1		1	1			2	
164	Fairport	44								5	5			5	1
165	Other villages	100	2					2	7	6	5	1		14	
166	Towns	553	1		4		3	4	11	116	112	2	2	38	5
167	MONTGOMERY COUNTY	794	2		1		3	6	23	62	49	5	8	71	15
168	Amsterdam	414	2				2	5	20	30	20	3	7	33	9
169	Fort Plain	48								3	2		1	3	2
170	Other villages	150			1			1	2	6	5	1		20	3
171	Towns	182					1		1	23	22	1		15	1
172	NASSAU COUNTY	1,343	4		5	1	7	16	31	98	74	16	3	111	17
173	Glen Cove	80	1		2				2	5	3	1	1	3	2
174	Cedarhurst	19							2					4	
175	Freeport	91	2						4	9	8	1		11	2
176	Lawrence	16					1		1						
177	Hempstead	65					1	1		3	2	1		9	2
178	Lynbrook	50								2	2			4	
179	Rockville Center	63						1	1	2	1		1	10	
180	Mineola	134						1	2	6	2	4		9	1
181	Other villages	111			1		2	2	4	8	7	1		10	
182	Towns	714	1		2	1	3	11	15	58	49	8	1	51	10
183	NIAGARA COUNTY	1,569	8		22	10	19	32	67	126	104	6	16	82	27
184	Lockport	290	1				2	2	11	13	10	1	2	13	10
185	Niagara Falls	657	4		21	5	6	22	22	40	26	4	10	28	8
186	North Tonawanda	191	3		1	4	1	6	11	13	10		3	10	3
187	La Salle	38				1	1	1	2	2	2			1	
188	Other villages	55					1	1	2	3	2		1	4	1
189	Towns	338					8		19	55	54	1		26	5

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births excluded)	Causes of Death — General Diseases: Typhoid fever 1	Smallpox 5	Measles 6	Scarlet fever 7	Whooping cough 8	Diphtheria 9	Influenza 10	Tuberculosis: Total all forms 28–35	Tuberculosis: Pulmonary 28, 29	Tuberculosis: Tuberculous meningitis 30	Tuberculosis: Other forms 31–35	Cancer 39–45	Diabetes 50
190	ONEIDA COUNTY	2,839	4		13	4	14	34	112	226	184	25	17	179	51
191	Rome	489	2		4		6	5	23	54	46	5	3	34	8
192	—Rome Custodial Asylum	79			1	1	1	1	5	30	30				
193	Utica	1,246	1		5	2	4	19	48	78	57	12	9	81	20
194	—Utica State Hospital	138								10	10			3	1
195	Sherrill	4													
196	Whitesboro	40								2	2			3	1
197	Other villages	224				1	1	2	6	16	13	2	1	15	3
198	Towns	619	1		3		2	7	30	36	26	6	4	43	18
199	ONONDAGA COUNTY	3,619	9		22	23	14	43	93	233	190	14	29	218	64
200	Syracuse	2,634	7		22	16	9	31	52	118	81	13	24	161	45
201	—State Institution for Feeble Minded, Syracuse	9								7	6		1		
202	Baldwinsville	44				1		1	3	1			1	3	1
203	East Syracuse	34							2					1	2
204	Solvay	59				2			2	5	4	1		2	1
205	Other villages	156					1	3	7	9	7		2	14	4
206	Towns	683	2			4	4	8	27	93	92		1	37	11
207	ONTARIO COUNTY	871	2		4	6	6	3	29	33	30		3	82	19
208	Canandaigua	176	1			1		1	1	5	3		2	17	6
209	Geneva	235			2	4	2	1	12	8	8			16	3
210	Villages	169	1		1		4		7	3	3			22	4
211	Towns	291			1	1		1	9	17	16		1	27	6

212	ORANGE COUNTY	1,929	6		3	2	11	14	83	193	175	10	8	120	26
213	Middletown	275	1		1	1		4	21	16	13	1	2	22	4
214	—Middletown State Hospital	141							14	19	19			3	2
215	Newburgh	498	3				4	3	3	57	52	2	3	33	5
216	Port Jervis	202						2	16	19	18		1	13	2
217	Goshen	51						1	1	4	3		1	5	1
218	Highland Falls	25								2	2			4	
219	Walden	48	1					1	2	7	6	1		8	1
220	Other villages	131	1		1		1		4	14	12	2		10	3
221	Towns	558			1	1	6	3	22	55	50	4	1	37	8
222	ORLEANS COUNTY	414	2		3		2	2	4	19	14	3	2	49	8
223	Albion	94	2		3		1		2	5	4		1	11	1
224	Medina	85						1		5	4	1		11	3
225	Other villages	30								2	1	1		4	1
226	Towns	205					1	1	2	7	5	1	1	23	3
227	OSWEGO COUNTY	1,055	2		22	1	6	7	34	34	32	1	1	98	20
228	Fulton	176			8		2	3	11	7	6		1	19	3
229	Oswego	284	1		7		1	2		7	6	1		25	8
230	Villages	158				1	2	1	10	1	1			17	4
231	Towns	437	1		7		1	1	13	19	19			37	5
232	OTSEGO COUNTY	722	1			4	1	6	21	33	30	1	2	49	8
233	Oneonta	188	1			1		3	5	2	2			20	2
234	Cooperstown	43						2	1	4	3		1	1	
235	Other villages	112					1	1	4	6	6			10	1
236	Towns	379				3			11	21	19	1	1	18	5
237	PUTNAM COUNTY	170						1	5	15	13		2	8	1
238	Villages	47						1	4	6	6				1
239	Towns	123							1	9	7		2	8	
240	RENSSELAER COUNTY	1,851	5		4	3	8	8	69	167	145	10	12	153	28
241	Rensselaer	114							4	8	8			9	
242	Troy	1,222	4		4	3	7	6	48	75	56	8	11	108	23
243	Hoosick Falls	76					1		8	5	5			1	2
244	Other villages	56						1	2	2	2			3	1
245	Towns	383	1					1	7	77	74	2	1	32	2
246	ROCKLAND COUNTY	674	2		3		1	9	20	63	54	5	4	45	7
247	Haverstraw	50						2		8	7	1		1	
248	Nyack	106			1			3	5	5	4		1	7	4
249	Spring Valley	27							2	3	3			2	
250	Suffern	48	1						1					7	
251	Other villages	95						1	2	4	3	1		7	1
252	Towns	323	1		2		1	3	10	35	32	2	1	21	2
253	—Letchworth village, Thiells	18								3	2		1		
254	—Hospital for Crippled and Deformed Children, West Haverstraw	7								5	3	1	1		

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births excluded)	CAUSES OF DEATH — GENERAL DISEASES: Typhoid fever 1	Smallpox 5	Measles 6	Scarlet fever 7	Whooping cough 8	Diphtheria 9	Influenza 10	Tuberculosis: Total all forms 28–35	Tuberculosis: Pulmonary 28, 29	Tuberculosis: Tuberculous meningitis 30	Tuberculosis: Other forms 31–35	Cancer 39–45	Diabetes 50
255	ST. LAWRENCE COUNTY	1,507	7		2	12	9	7	77	81	69	5	7	74	11
256	Ogdensburg	308	2			4		4	14	7	5	2		16	4
257	—St. Lawrence State Hospital	160							1	22	22			3	
258	Canton	42				1			2	2	2			4	1
259	Gouverneur	61							1	2	2			9	1
260	Massena	88	1			1	2	1	4	2	2			1	
261	Potsdam	60	1			1			7	3	2	1		3	
262	Other villages	79			1				2	3	2		1	4	1
263	Towns	709	3		1	5	7	2	46	40	32	2	6	34	4
264	SARATOGA COUNTY	916	6		1	20	7	1	33	71	65	2	4	59	11
265	Saratoga Springs	251	1				1	1	5	16	14	1	1	11	5
266	Mechanicville	107	1			18			3	3	1		2	8	1
267	Ballston Spa	66					2		2	5	5			9	2
268	Waterford	59	1				2		1	2	2			3	
269	Other villages	103	1						6	6	5	1		8	1
270	Towns	330	2		1	2	2		16	39	38		1	20	2
271	SCHENECTADY COUNTY	1,199	8		10	2	5	7	53	92	85	4	3	81	21
272	Schenectady	956	7		9	2	5	7	46	58	53	3	2	61	14
273	Scotia	34	1		1				1	2	2			3	2
274	Towns	209							6	32	30	1	1	17	5

275	SCHOHARIE COUNTY	350	1						12	12	11		1	28	6
276	Villages	67	1						1	2	2			6	2
277	Towns	283							11	10	9		1	22	4
278	SCHUYLER COUNTY	232			1				5	10	9		1	17	4
279	Watkins	58							1	4	4			7	1
280	Other villages	42							3	3	2		1	2	1
281	Towns	132			1				1	3	3			8	2
282	SENECA COUNTY	638	8			2	1	1	7	73	66	2	5	32	3
283	Seneca Falls	125	6			1	1	1	1	8	6	2		14	2
284	Waterloo	71	1			1			1					2	
285	Other villages	18												2	
286	Towns	134							5	5	5			11	
287	—Willard State Hospital	290	1							60	55		5	3	1
288	STEUBEN COUNTY	1,437	2			1	4	3	50	58	53	2	3	116	21
289	Corning	242					1	1	15	14	13		1	14	2
290	Hornell	221						1	9	13	12		1	22	4
291	Bath	100							1	5	4		1	12	2
292	Other villages	208					1	1	6	7	6	1		23	3
293	Towns	498	2			1	2		19	18	17	1		37	8
294	—Soldiers' and Sailors' Home	108								1	1			8	2
295	SUFFOLK COUNTY	2,241	9		5	6	7	6	53	242	231	5	6	120	21
296	Amityville	90	1		1				2	2	2			3	1
297	Babylon	48	3							1	1			6	1
298	Greenport	55							2	2	2			5	2
299	Patchogue	55				2			1					4	
300	Sag Harbor	36							2	2	2			1	1
301	Southampton	77						1	2					4	
302	Other villages	39	1			1			1					4	1
303	Towns	988	3		4	3	7	5	32	74	65	5	4	76	13
304	—Central Islip State Hospital	559	1						6	95	95			9	
305	—Kings Park State Hospital	294							5	66	64		2	8	2
306	SULLIVAN COUNTY	625	2		1			6	11	215	208	2	5	31	10
307	Villages	182						1	1	118	116		2	6	1
308	Towns	443	2		1			5	10	97	92	2	3	25	9
309	TIOGA COUNTY	394	3			1	1	6	17	8	8			33	5
310	Owego	81	2			1		1	3	1	1			5	1
311	Waverly	64	1							2	2			7	2
312	Other villages	51						1		1	1			6	
313	Towns	198					1	4	14	4	4			15	2
314	TOMPKINS COUNTY	531	1				4		18	25	19	1	5	51	5
315	Ithaca	274	1				3		12	11	6	1	4	27	3
316	Villages	67							2	1	1			5	
317	Towns	190					1		4	13	12		1	19	2

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line No.	STATE AND SUBDIVISIONS, BY COUNTIES	Total deaths all causes (still-births excluded)	Causes of Death — General Diseases: Typhoid fever 1	Smallpox 5	Measles 6	Scarlet fever 7	Whooping cough 8	Diphtheria 9	Influenza 10	Tuberculosis: Total all forms 28–35	Tuberculosis: Pulmonary 28, 29	Tuberculosis: Tuberculous meningitis 30	Tuberculosis: Other forms 31–35	Cancer 39–45	Diabetes 50
318	ULSTER COUNTY	1,236	8	......	7	2	5	13	37	127	118	1	8	78	22
319	Kingston	450	3	......	1	......	2	5	11	42	38	......	4	29	10
320	Ellenville	60	......	......	......	......	......	1	......	5	4	......	1	5	......
321	Saugerties	72	......	......	......	......	1	......	......	12	12	......	......	5	1
322	Other villages	56	......	......	......	......	......	......	1	1	1	......	......	5	1
323	Towns	598	5	......	6	2	2	7	25	67	63	1	3	34	10
324	—Eastern New York Reformatory, Napanoch	......	......	......	......	......	......	......	......	......	......	......	......	......	......
325	WARREN COUNTY	503	4	......	......	1	1	1	17	29	25	3	1	37	12
326	Glens Falls	274	2	......	......	......	1	1	3	21	18	2	1	28	9
327	Villages	12	......	......	......	......	......	......	......	1	1	......	......	1	......
328	Towns	217	2	......	......	1	......	......	14	7	6	1	......	8	3
329	WASHINGTON COUNTY	613	......	......	1	......	4	5	16	27	25	......	2	48	8
330	Fort Edward	39	......	......	......	......	......	2	......	1	1	......	......	4	1
331	Granville	35	......	......	......	......	......	......	......	5	4	......	1	2	1
332	Hudson Falls	79	......	......	......	......	......	......	1	4	4	......	......	8	......
333	Whitehall	58	......	......	......	......	1	1	1	2	2	......	......	7	......
334	Other villages	110	......	......	1	......	......	......	2	6	6	......	......	10	1
335	Towns	291	......	......	......	......	3	2	12	9	8	......	1	17	5
336	—Gt. Meadow Prison, Comstock	1	......	......	......	......	......	......	......	......	......	......	......	......	......

337	WAYNE COUNTY	695	3		4	1	1		24	37	28	6	3	54	9
338	Clyde	40							1	1		1		4	
339	Lyons	63							3	1	1			1	1
340	Newark	76	1						3	5	4		1	5	1
341	Other villages	105							6	5	3	1	1	13	
342	Towns	402	2		4	1	1		11	23	18	4	1	30	6
343	—Newark State Custodial Asylum	9								2	2			1	1
344	WESTCHESTER COUNTY	4,205	5		31	12	33	56	145	363	312	21	30	406	81
345	Mt. Vernon	524			14		6	5	32	31	23	3	5	39	13
346	New Rochelle	401			2	2	1	2	11	20	17	2	1	40	7
347	Ossining	132	1					3	8	8	7		1	13	2
348	—Sing Sing Prison	22								1			1		
349	Peekskill	226				1		4	11	9	8		1	24	4
350	White Plains	267	1		1	3	1	1	10	22	15	2	5	25	10
351	Port Chester	208	1				3	5	11	13	11	1	1	14	4
352	Yonkers	1,153			9	3	12	25	28	143	121	11	11	87	23
353	Bronxville	53								2	1		1	6	
354	Dobbs Ferry	53						1	1	2	1	1		2	
355	Hastings-on-Hudson	30					3			2	2			3	
356	Irvington	18				1								3	
357	Mamaroneck	61			1				1	5	5			4	
358	Mt. Kisco	71			3	1	1		1	4	4			6	2
359	North Tarrytown	59					2	1	5	3	3			4	2
360	Pleasantville	28							1	5	5			5	1
361	Rye	45						3	3	2	1	1		3	
362	Tarrytown	71				1	1	1	2	2	2			8	2
363	Scarsdale	17							1	1	1			3	
364	Tuckahoe	29							1	2	2			3	
365	Other villages	113							2	6	5		1	9	
366	Towns	623	2		1		3	5	16	79	77		2	105	11
367	—State Reformatory for Women, Bedford	1								1	1				
368	WYOMING COUNTY	431	2		2		2	3	17	26	24	1	1	31	5
369	Perry	66					1	3	6	6	5	1		4	
370	Warsaw	75	1						2	3	3			2	
371	Other villages	88			1					10	9		1	8	2
372	Towns	202	1		1		1		9	7	7			17	3
373	YATES COUNTY	270	3			1		1	9	6	6			24	4
374	Penn Yan	87	1						2	2	2			7	1
375	Other villages	32							3					2	2
376	Towns	151	2			1		1	4	4	4			15	1

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS BY COUNTIES	CAUSES OF DEATH — (*Continued*) DISEASES OF THE NERVOUS SYSTEM: Cerebrospinal meningitis 61b, c	Acute anterior poliomyelitis 63a	Apoplexy and cerebral hemorrhage 64	DISEASES OF THE CIRCULATORY SYSTEM: Organic heart disease 79	Arteriosclerosis 81	DISEASES OF THE RESPIRATORY SYSTEM: Bronchitis 89, 90	Pneumonia: Total all forms 91, 92	Pneumonia: Broncho 91	Pneumonia: Lobar and unqualified 92	DISEASES OF THE DIGESTIVE SYSTEM: Diarrhea and enteritis (under 2 years) 104	Appendicitis 108	Hernia, intestinal obstruction 109	Cirrhosis of liver 113	Nephritis and Bright's disease 119, 120
1	**STATE OF NEW YORK**	190	50	6,852	21,696	4,883	1,759	16,475	7,568	8,907	4,662	1,406	1,215	779	10,481
2	**New York City**	123	40	718	11,342	2,824	918	10,058	4,874	5,184	2,545	792	653	366	4,833
3	**Remainder of State**	67	10	6,134	10,354	2,059	841	6,417	2,694	3,723	2,117	614	562	413	5,648
4	**Cities**	47	5	2,587	4,555	728	413	3,535	1,479	2,056	1,388	467	351	206	2,876
5	**Villages**	15	2	1,281	1,868	343	143	958	398	560	233	76	73	65	913
6	**Towns**	5	3	2,164	3,368	733	262	1,635	666	969	435	62	115	130	1,607
7	**Institutional districts**	......	......	102	563	255	23	289	151	138	61	9	23	12	252
8	ALBANY COUNTY	6	......	219	413	88	15	304	123	181	55	27	31	9	293
9	Albany	3	......	134	271	57	9	172	78	94	22	21	17	6	197
10	Cohoes	2	......	29	43	4	2	46	16	30	14	3	5	1	32
11	Watervliet	......	......	10	29	1	1	29	10	19	8	1	3	......	24
12	Green Island	1	......	4	14	1	......	8	3	5	3	......	3	1	12
13	Other villages	......	......	4	3	1	1	5	1	4	......	......	......	......	4
14	Towns	......	......	38	53	24	2	44	15	29	8	2	3	1	24
15	ALLEGANY COUNTY	1	......	49	102	30	7	50	18	32	6	4	3	4	49
16	Wellsville	......	......	4	8	6	3	6	3	3	......	4	1	1	11
17	Other villages	1	......	20	33	7	......	10	3	7	4	......	......	2	12
18	Towns	......	......	25	61	17	4	34	12	22	2	......	2	1	26
19	BROOME COUNTY	1	......	143	241	61	25	170	62	108	53	13	14	13	135
20	Binghamton	......	......	86	107	16	14	83	32	51	28	8	8	6	75

21	—Binghamton State Hospital	...	...	3	41	22	...	22	8	14	...	...	4	...	29
22	Endicott	...	...	1	9	1	1	4	1	3	7	1	...	1	7
23	Johnson City	1	...	8	17	...	2	20	6	14	6	4	...	1	4
24	Union	...	...	3	6	...	4	4	1	3	...	...	...	...	2
25	Other villages	...	...	9	8	1	2	4	3	1	...	...	1	1	6
26	Towns	...	...	33	53	21	2	33	11	22	12	...	1	4	12
27	CATTARAUGUS COUNTY	...	...	88	172	23	9	91	35	56	11	10	13	1	88
28	Olean	...	...	18	36	2	4	36	13	23	2	7	5	...	21
29	Salamanca	...	...	8	15	4	2	12	5	7	3	2	2	...	10
30	Gowanda *	...	...	3	5	1	...	3	1	2	1	...	1	...	7
31	Other villages	...	...	24	44	8	...	14	9	5	1	...	1	...	16
32	Towns	...	...	35	72	8	3	26	7	19	4	1	4	1	34
33	CAYUGA COUNTY	2	...	122	181	26	13	90	34	58	27	7	7	7	68
34	Auburn	1	...	52	77	7	5	66	26	40	16	5	5	1	39
35	—Auburn State Prison	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	Villages	...	...	23	34	3	...	2	1	1	3	1	...	1	7
37	Towns	1	...	47	70	16	8	22	7	15	8	1	2	5	22
38	CHAUTAUQUA COUNTY	2	...	151	250	35	17	143	44	99	34	5	12	9	109
39	Dunkirk	...	...	11	30	1	3	17	7	10	8	1	2	3	14
40	Jamestown	1	...	48	71	10	8	52	13	39	10	2	6	3	36
41	Falconer	1	...	3	3	...	2	6	1	5	...	...	...	...	5
42	Fredonia	...	...	7	10	1	...	4	1	3	3	...	1	...	7
43	Silver Creek	...	...	2	4	2	...	3	...	3	1	...	...	...	...
44	Westfield	...	...	10	9	...	...	5	1	4	...	...	...	...	3
45	Other villages	...	...	21	34	2	...	15	10	5	1	...	...	1	11
46	Towns	...	...	49	89	19	4	41	11	30	11	2	3	2	33
47	CHEMUNG COUNTY	3	...	72	113	24	2	48	29	19	8	8	15	5	127
48	Elmira	3	...	42	70	14	...	33	18	15	7	8	13	4	88
49	—Elmira State Reformatory	...	...	...	...	...	...	1	1	...	...	...	...	...	...
50	Elmira Heights	...	...	3	...	...	...	1	1	...	1	...	1	1	4
51	Other villages	...	...	6	6	1	1	1	1	...	...	...	...	...	4
52	Towns	...	...	21	37	9	1	12	8	4	...	...	1	...	31
53	CHENANGO COUNTY	...	...	94	96	25	9	44	15	29	7	3	7	6	52
54	Norwich	...	...	8	24	2	3	17	7	10	3	2	4	1	15
55	Villages	...	...	23	23	7	...	4	1	3	...	...	1	1	13
56	Towns	...	...	62	45	8	4	23	7	16	4	1	1	4	24
57	—Woman's Relief Corps Home, Oxford	...	...	1	4	8	2	...	...	...	...	...	1	...	...
58	CLINTON COUNTY	...	...	47	104	14	11	38	17	21	36	3	6	6	41
59	Plattsburg	...	...	22	27	3	5	7	2	5	8	3	3	3	9
60	Villages	...	...	3	12	...	1	7	2	5	6	...	...	...	10
61	Towns	...	...	22	64	11	5	22	13	9	22	...	3	3	20
62	—Clinton Prison	...	...	...	...	...	...	...	...	...	...	...	...	...	...
63	—Dannemora State Hospital	...	...	...	1	...	...	2	...	2	...	...	...	...	2

* Gowanda, village, is located in two counties, Cattaraugus and Erie. No deaths were reported for that part located in Erie county.

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	Causes of Death — (Continued): Diseases of the nervous system: Cerebrospinal meningitis 61b, c	Acute anterior poliomyelitis 63a	Apoplexy and cerebral hemorrhage 64	Diseases of the circulatory system: Organic heart disease 79	Arteriosclerosis 81	Diseases of the respiratory system: Bronchitis 89, 90	Pneumonia: Total all forms 91, 92	Broncho 91	Lobar and unqualified 92	Diseases of the digestive system: Diarrhea and enteritis (under 2 years) 104	Appendicitis 108	Hernia, intestinal obstruction 109	Cirrhosis of liver 113	Nephritis and Bright's disease 119, 120
64	COLUMBIA COUNTY	......	1	60	99	38	7	41	25	16	8	2	7	6	61
65	Hudson	......	......	16	25	7	4	10	9	1	5	2	4	4	15
66	—State Training School for Girls, Hudson	......	......	......	......	......	......	......	......	......	......	......	......	......	......
67	Chatham	......	......	2	1	2	......	2	1	1	......	......	......	......	4
68	Villages	......	1	6	7	3	1	3	1	2	......	......	......	......	4
69	Towns	......	......	36	66	26	2	26	14	12	3	......	3	2	38
70	CORTLAND COUNTY	1	......	52	73	17	3	48	22	26	5	4	5	3	30
71	Cortland	......	......	22	29	2	1	26	9	17	3	3	3	1	15
72	Homer	1	......	9	6	5	......	3	2	1	......	......	......	......	1
73	Other villages	......	......	4	9	2	......	2	1	1	......	......	......	......	1
74	Towns	......	......	17	29	8	2	17	10	7	2	1	2	2	13
75	DELAWARE COUNTY	......	......	88	115	15	6	58	20	38	7	6	2	3	57
76	Sidney	......	......	6	11	2	......	1	1	......	......	1	......	......	2
77	Walton	......	......	7	18	......	1	5	1	4	1	......	......	1	5
78	Other villages	......	......	17	24	2	2	13	4	9	1	2	1	......	13
79	Towns	......	......	58	62	11	3	39	14	25	5	3	1	2	37
80	DUTCHESS COUNTY	1	......	152	266	117	15	173	69	104	18	9	21	12	110
81	Beacon	1	......	14	30	3	2	16	5	11	1	1	3	1	14
82	—Matteawan State Hospital	......	......	1	4	......	......	2	......	2	......	......	......	......	4
83	Poughkeepsie	......	......	47	80	21	4	66	19	47	11	4	8	6	24

84	Wappingers Falls			4	10		2	4	1	3	1		1		2
85	Other villages			16	20	1	1	11	1	10			2	2	11
86	Towns			57	75	22	6	46	23	23	5	4	4	2	49
87	—Hudson River State Hospital			13	47	70		28	20	8			3	1	6
88	Erie County	6		546	1,048	202	130	922	384	538	610	112	62	50	712
89	Buffalo	6		426	826	134	88	725	291	434	464	103	50	38	578
90	Buffalo State Hospital			5	21	9		38	19	19			2	1	30
91	Lackawanna			3	6	1	1	33	18	15	24			1	8
92	—Our Lady of Victory Infant Home, Lackawanna						11	23	11	12	54	4	1		1
93	Tonawanda			4	16	1	4	8	4	4	10		3		2
94	Depew			1	1		6	6	1	5	12	1			3
95	East Aurora			7	6	2		2		2	1				5
96	Hamburg			3	11	2		6	3	3					9
97	Lancaster			5	5	1	6	4	2	2	8	1			3
98	Kenmore			9	1	1		3	1	2					1
99	Other villages			22	22	14	2	8	3	5	6	1	1	3	9
100	Towns			60	120	36	12	52	27	25	31	2	4	7	59
101	—Gowanda State Hospital			1	13	1		14	4	10			1		4
102	Essex County			43	53	15	6	41	18	23	16	5	2	1	41
103	Villages			11	19	4	2	5	3	2	7	4	1		13
104	Towns			32	34	11	4	36	15	21	9	1	1	1	28
105	—Raybrook Hospital for Incipient Tuberculosis														
106	Franklin County	1		48	90	20	6	74	26	48	40	9	2	4	38
107	Malone			9	15	9	1	15	4	11	8	5	1		6
108	Saranac Lake *			4	2		1	5	1	4	1				1
109	*Saranac Lake*			6	4		1	5	1	4	2	1			2
110	Other villages	1		5	8		1	9	3	6	2				1
111	Towns			30	65	11	3	45	18	27	29	4	1	4	30
112	Fulton County	2		94	138	20	13	52	13	39	13	1	9	5	75
113	Gloversville	2		54	63	9	2	25	7	18	7	1	7	3	37
114	Johnstown			16	23	8	10	12	3	9	3		2		18
115	Villages			2	7	1		1		1	1				4
116	Towns			22	45	2	1	14	3	11	2			2	16
117	Genesee County	1		59	91	21	15	38	18	20	6	4	3	5	37
118	Batavia	1		19	27	9	11	16	7	9	4	4	1	1	14
119	Le Roy			7	8	4	1	7	3	4					3
120	Other villages			3	5	1		4	2	2					7
121	Towns			30	51	7	3	11	6	5	2		2	4	13
122	Greene County	1		65	70	17	6	28	10	18	3	2	3	2	31
123	Catskill	1		14	22	3	1	8	3	5	1			1	2
124	Other villages			11	7	2	1	6	4	2	1	1		1	5
125	Towns			40	41	12	4	14	3	11	1	1	3		24

* Saranac Lake, village, is located in two counties, Essex and Franklin. This total represents that part of the village located in Franklin county. The total for entire village is shown in blackface type.

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	CAUSES OF DEATH — (*Continued*) Diseases of the nervous system: Cerebrospinal meningitis 61b, c	Diseases of the nervous system: Acute anterior poliomyelitis 63a	Diseases of the nervous system: Apoplexy and cerebral hemorrhage 64	Diseases of the circulatory system: Organic heart disease 79	Diseases of the circulatory system: Arteriosclerosis 81	Diseases of the respiratory system: Bronchitis 89, 90	Diseases of the respiratory system: Pneumonia: Total all forms 91, 92	Diseases of the respiratory system: Pneumonia: Broncho 91	Diseases of the respiratory system: Pneumonia: Lobar and unqualified 92	Diseases of the digestive system: Diarrhea and enteritis (under 2 years) 104	Diseases of the digestive system: Appendicitis 108	Diseases of the digestive system: Hernia, intestinal obstruction 109	Diseases of the digestive system: Cirrhosis of liver 113	Nephritis and Bright's disease 119, 120
126	HAMILTON COUNTY	...	...	5	5	...	...	8	5	3	...	...	...	1	3
127	Towns	...	...	5	5	...	...	8	5	3	...	...	...	1	3
128	HERKIMER COUNTY	...	...	72	126	12	7	73	33	40	31	6	7	5	63
129	Little Falls	...	...	13	22	1	3	11	2	9	11	4	3	2	10
130	Dolgeville*	...	...	5	1	2		3	1	2	...	...	...	...	...
131	*Dolgeville*	...	...	5	1	2	...	3	1	2	...	...	...	...	1
132	Frankfort	...	...	5	10	...	...	3	2	1	5	...	1	1	3
133	Herkimer	...	...	14	15	...	...	24	14	10	2	1	2	...	7
134	Ilion	...	...	10	20	1	1	9	2	7	5	1	1	...	12
135	Mohawk	...	...	3	3	1	...	6	5	1	...	...	...	1	8
136	Other villages	...	...	4	9	3	1	2	1	1	2	...	...	...	5
137	Towns	...	...	18	46	4	2	15	6	9	6	...	...	1	18
138	JEFFERSON COUNTY	...	...	140	219	49	9	100	45	55	26	12	14	4	81
139	Watertown	...	...	54	87	13	2	50	20	30	12	11	10	...	36
140	Carthage	...	...	3	7	2	1	1	1	...	4	...	...	...	2
141	Other villages	...	...	35	46	11	4	15	7	8	3	...	1	1	21
142	Towns	...	...	48	79	23	2	34	17	17	7	1	3	3	22
143	LEWIS COUNTY	...	...	50	61	7	4	30	9	21	5	1	2	2	16
144	Lowville	...	...	10	13	...		3	1	2	...	...	...	...	2
145	Other villages	...	...	8	10	1	...	10	2	8	1	...	1	...	2
146	Towns	...	...	32	38	6	4	17	6	11	4	1	1	2	12

* Dolgeville, village, is located in two counties, Fulton and Herkimer. This total represents that part of the village located in Herkimer county. The total for the entire village is shown in blackface type.

147	LIVINGSTON COUNTY			41	115	11	8	69	35	34	7	2	2	2	25
148	Avon			4	4			3	2	1	2				
149	Dansville			5	11	5		8	3	5		1			5
150	Mount Morris			1	5		1	7	4	3	2				3
151	Other villages			12	43	2		5	2	3	1				4
152	Towns			15	43	3	7	19	5	14	2	1	2	1	10
153	—Craig Colony, Sonyea			4	9	1		27	19	8				1	3
154	MADISON COUNTY			76	134	23	11	52	24	28	8	5	4	1	28
155	Oneida			9	35	11	2	15	6	9	5	3	2		3
156	Canastota			10	9	1		5	3	2		1	1		3
157	Other villages			15	21	4	1	16	7	9					7
158	Towns			42	69	7	8	16	8	8	3	1	1	1	15
159	MONROE COUNTY	5	1	386	657	110	35	354	159	195	155	56	27	35	403
160	Rochester	5	1	287	485	65	27	308	130	178	147	55	23	29	360
161	—Rochester State Hospital			7	42	21	1	9	9				1	1	7
162	Brockport			8	8	2	1	3	1	2				1	3
163	East Rochester			2	6			5	3	2			1	1	1
164	Fairport			10	8	2	1	3	2	1	1				
165	Other villages			16	17	1		4	3	1			1		7
166	Towns			56	91	19	5	22	11	11	7	1	1	3	25
167	MONTGOMERY COUNTY	1		82	121	30	14	51	21	30	19	9	7	7	44
168	Amsterdam	1		36	46	13	7	26	13	13	15	8	5	4	15
169	Fort Plain			3	12	2	1	4	2	2	2	1			4
170	Other villages			17	20	7	2	14	4	10	2		1	2	11
171	Towns			26	43	8	4	7	2	5			1	1	14
172	NASSAU COUNTY	2		123	181	20	12	136	59	77	44	12	15	5	107
173	Glen Cove			13	13			11	5	6	4		1		6
174	Cedarhurst			2	3			4		4					1
175	Freeport			14	8	1	1	10	2	8	1			1	8
176	Lawrence			3	2			1		1					1
177	Hempstead			7	13	2	1	1		1	3		1		9
178	Lynbrook			5	8	1	1	10	5	5	1			1	3
179	Rockville Center	1		7	10	2	1	4		4	1	1	1		4
180	Mineola	1		6	11	1		5	2	3	3	5	4		9
181	Other villages			10	20	3	1	10	6	4	2		3		6
182	Towns			56	93	10	7	80	39	41	29	6	5	3	60
183	NIAGARA COUNTY	1		100	176	33	29	141	68	73	72	13	17	7	85
184	Lockport	1		25	49	8	5	20	8	12	10	2	5	1	12
185	Niagara Falls			26	48	15	7	78	44	34	43	4	7	4	37
186	North Tonawanda			8	16	1	8	16	8	8	6	6	2		4
187	La Salle			5	6			4	1	3			1		2
188	Other villages			2	11	1	2	4	2	2				1	7
189	Towns			34	46	8	7	19	5	14	13	1	2	1	23

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	CAUSES OF DEATH — (*Continued*) — Diseases of the nervous system: Cerebrospinal meningitis 61b, c	Diseases of the nervous system: Acute anterior poliomyelitis 63a	Diseases of the nervous system: Apoplexy and cerebral hemorrhage 64	Diseases of the circulatory system: Organic heart disease 79	Diseases of the circulatory system: Arteriosclerosis 81	Diseases of the respiratory system: Bronchitis 89, 90	Diseases of the respiratory system: Pneumonia: Total all forms 91, 92	Pneumonia: Broncho 91	Pneumonia: Lobar and unqualified 92	Diseases of the digestive system: Diarrhea and enteritis (under 2 years) 104	Diseases of the digestive system: Appendicitis 108	Diseases of the digestive system: Hernia, intestinal obstruction 109	Diseases of the digestive system: Cirrhosis of liver 113	Nephritis and Bright's disease 119, 120
190	ONEIDA COUNTY	3		203	461	67	56	256	89	167	91	19	27	13	219
191	Rome			42	59	6	8	35	13	22	18	4		1	47
192	—Rome Custodial Asylum				3	1	2	6	2	4	6		3		
193	Utica	2		75	188	25	28	132	43	89	54	13	12	6	96
194	—Utica State Hospital			6	57	1		9	2	7					9
195	Sherrill			1				1		1					1
196	Whitesboro			3	14			2	1	1	1				4
197	Other villages			29	46	5	7	17	7	10	2		3	4	18
198	Towns	1		47	94	29	11	54	21	33	10	2	9	2	44
199	ONONDAGA COUNTY	4		289	515	73	33	492	229	263	158	32	24	26	233
200	Syracuse	4		186	369	38	20	389	182	207	132	31	24	17	176
201	—State Institution for Feeble Minded, Syracuse			1	1										
202	Baldwinsville			8	4	2	1	4	2	2	2				3
203	East Syracuse			2	4	1		6	3	3	2				4
204	Solvay			8	5	2	2	9	7	2	3			1	1
205	Other villages			14	28	5		17	6	11	3			1	10
206	Towns			70	104	25	10	67	29	38	16	1		7	39
207	ONTARIO COUNTY			96	120	31	12	69	26	43	20	19	7	9	60
208	Canandaigua			21	17	1	3	17	7	10	1	5	3	2	11
209	Geneva			19	31	7	2	22	8	14	16	11	2		12
210	Villages			22	23	5	1	7	6	1		3		4	15
211	Towns			34	49	18	6	23	5	18	3		2	3	22

212	ORANGE COUNTY	5	2	181	252	46	15	169	66	108	41	14	16	15	195
213	Middletown	1	...	40	39	13	2	16	8	8	1	5	2	5	23
214	—Middletown State Hospital	...	...	9	16	9	1	5	1	4	...	...	2	...	16
215	Newburgh	2	1	48	65	8	2	47	12	35	12	6	5	...	73
216	Port Jervis	1	...	11	22	4	2	18	5	13	8	3	3	5	12
217	Goshen	...	...	4	5	2	1	7	2	5	...	...	...	1	2
218	Highland Falls	...	...	2	2	...	...	2	1	1	...	...	...	...	4
219	Walden	...	...	6	3	1	...	3	3	...	...	...	...	...	8
220	Other villages	1	...	12	20	2	2	22	11	11	4	...	...	...	10
221	Towns	...	1	49	80	7	5	49	23	26	16	...	4	4	47
222	ORLEANS COUNTY	...	...	35	87	14	8	31	12	19	6	1	2	8	27
223	Albion	...	...	11	15	1	...	6	1	5	3	1	1	1	4
224	Medina	...	...	6	20	4	1	8	2	6	2	...	...	...	1
225	Other villages	...	...	5	5	4	...	2	1	1	...	...	...	...	1
226	Towns	...	...	13	47	5	2	15	8	7	1	...	1	2	21
227	OSWEGO COUNTY	...	2	121	209	25	17	71	27	44	25	8	9	7	94
228	Fulton	...	...	8	28	3	5	18	3	15	9	...	2	...	9
229	Oswego	...	1	33	63	6	1	18	8	10	8	1	3	2	25
230	Villages	...	...	28	30	4	3	7	4	3	...	1	1	...	19
231	Towns	...	1	52	88	12	8	28	12	16	8	1	3	5	41
232	OTSEGO COUNTY	...	...	73	140	19	8	59	21	38	5	5	7	6	68
233	Oneonta	...	...	15	21	4	2	25	8	17	1	3	3	...	21
234	Cooperstown	...	...	1	5	...	...	4	3	1	1	2	...	1	3
235	Other villages	...	...	10	22	4	1	5	...	5	2	...	...	1	11
236	Towns	...	...	47	92	11	5	25	10	15	1	...	4	4	31
237	PUTNAM COUNTY	...	...	14	21	18	1	13	8	5	5	...	1	1	17
238	Villages	...	...	6	4	2	...	5	4	1	1	...	...	1	7
239	Towns	...	...	8	17	16	1	8	4	4	4	...	1	...	10
240	RENSSELAER COUNTY	...	1	145	286	48	29	176	85	91	41	22	21	10	157
241	Rensselaer	...	...	7	17	7	1	13	10	3	4	...	2	1	14
242	Troy	...	1	85	180	21	21	121	57	64	29	21	17	7	100
243	Hoosick Falls	...	...	11	18	3	...	8	3	5	3	...	1	...	7
244	Other villages	...	...	8	9	4	1	3	2	1	...	...	...	...	6
245	Towns	...	...	34	62	13	6	31	13	18	5	1	1	2	30
246	ROCKLAND COUNTY	1	...	68	101	18	8	54	18	36	18	6	5	2	62
247	Haverstraw	...	...	7	11	1	...	6	2	4	2	...	...	...	8
248	Nyack	...	...	7	16	4	1	8	1	7	1	4	4	...	4
249	Spring Valley	...	...	3	...	...	1	1	1	...	...	...	...	1	5
250	Suffern	...	...	3	4	1	...	2	1	1	1	2	1	...	2
251	Other villages	...	...	12	17	1	4	11	4	7	3	...	...	...	9
252	Towns	1	...	36	52	11	2	23	7	16	10	...	...	1	32
253	—Letchworth Village, Thiells	...	...	...	1	...	...	2	2	...	1	...	...	...	2
254	—Hospital for Crippled and Deformed Children, West Haverstraw	...	...	...	...	...	...	1	...	1	...	...	...	...	...

Table 16 — New York State Cities and Villages of 2,500 and Over: ***Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:*** **1920 — (Continued)**

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	CAUSES OF DEATH — (*Continued*) DISEASES OF THE NERVOUS SYSTEM: Cerebrospinal meningitis 61b, c	DISEASES OF THE NERVOUS SYSTEM: Acute anterior poliomyelitis 63a	DISEASES OF THE NERVOUS SYSTEM: Apoplexy and cerebral hemorrhage 64	DISEASES OF THE CIRCULATORY SYSTEM: Organic heart disease 79	DISEASES OF THE CIRCULATORY SYSTEM: Arteriosclerosis 81	DISEASES OF THE RESPIRATORY SYSTEM: Bronchitis 89, 90	DISEASES OF THE RESPIRATORY SYSTEM: Pneumonia: Total all forms 91, 92	DISEASES OF THE RESPIRATORY SYSTEM: Pneumonia: Broncho 91	DISEASES OF THE RESPIRATORY SYSTEM: Pneumonia: Lobar and unqualified 92	DISEASES OF THE DIGESTIVE SYSTEM: Diarrhea and enteritis (under 2 years) 104	DISEASES OF THE DIGESTIVE SYSTEM: Appendicitis 108	DISEASES OF THE DIGESTIVE SYSTEM: Hernia, intestinal obstruction 109	DISEASES OF THE DIGESTIVE SYSTEM: Cirrhosis of liver 311	Nephritis and Bright's disease 119, 120
255	ST. LAWRENCE COUNTY	4	1	143	247	69	19	133	60	73	56	4	10	8	96
256	Ogdensburg	4	...	20	32	21	9	26	13	13	14	4	3	2	23
257	—St. Lawerence State Hospital	...	...	11	59	1	...	12	5	7	...	...	1	2	13
258	Canton	...	...	7	10	1	...	3	1	2	1	...	...	...	1
259	Gouverneur	...	...	14	13	2	...	3	2	1	...	...	1	...	2
260	Massena	...	...	4	11	2	1	16	7	9	7	...	...	...	5
261	Potsdam	...	1	8	9	6	...	1	...	1	...	...	1	...	3
262	Other villages	...	...	8	20	5	...	6	5	1	4	...	1	...	8
263	Towns	...	...	71	93	31	9	66	27	39	30	...	3	4	41
264	SARATOGA COUNTY	...	...	80	141	23	14	95	33	62	14	6	7	8	100
265	Saratoga Springs	...	...	17	37	7	4	29	8	21	...	4	3	3	35
266	Mechanicville	...	...	7	12	2	...	9	5	4	2	...	2	1	9
267	Ballston Spa	...	...	4	13	...	2	5	2	3	...	...	1	...	11
268	Waterford	...	...	4	14	2	...	5	2	3	2	...	...	1	7
269	Other villages	...	...	9	17	1	4	15	8	7	3	...	...	1	12
270	Towns	...	...	39	48	11	4	32	8	24	7	2	1	2	26
271	SCHENECTADY COUNTY	2	1	97	136	41	13	91	59	32	56	15	7	8	76
272	Schenectady	2	...	78	104	35	9	74	50	24	47	15	7	8	60
273	Scotia	...	...	1	10	1	1	1	1	...	...	...	...	...	...
274	Towns	...	1	18	22	5	3	16	8	8	9	...	...	...	16

275	SCHOHARIE COUNTY			34	84	6	4	14	8	6	3		3	2	52
276	Villages			5	18	1		1	1		1				14
277	Towns			29	66	5	4	13	7	6	2		3	2	38
278	SCHUYLER COUNTY			35	58	6	4	8	3	5		1		5	24
279	Watkins			8	15	3	2					1			4
280	Other villages			4	10	1		1		1				1	5
281	Towns			23	33	2	2	7	3	4				4	15
282	SENECA COUNTY	1		55	129	24	1	67	33	34	6	4	2	1	70
283	Seneca Falls			12	25	3		11	5	6	1	3	1		5
284	Waterloo			11	15	6	1	5		5	2			1	2
285	Other villages			5	3						1				1
286	Towns	1		21	22	7		13	5	8	2		1		13
287	—Willard State Hospital			6	64	8		38	23	15		1			49
288	STEUBEN COUNTY			167	290	84	14	97	45	52	18	22	13	9	119
289	Corning			22	27	3	3	25	9	16	1	4	6		26
290	Hornell			26	36	7	2	13	8	5	1	6	3	3	17
291	Bath			15	13	3		7	5	2	3	6	1		7
292	Other villages			28	27	19	3	16	12	4	2			2	16
293	Towns			68	85	33	5	34	11	23	11	5	3	2	39
294	—Soldiers' and Sailors' Home			8	102	19	1	2		2		1		2	14
295	SUFFOLK COUNTY	1		166	263	136	20	146	63	83	29	10	13	11	196
296	Amityville	1		16	13	5		2		2					17
297	Babylon			6	7			3	1	2		1		1	5
298	Greenport			2	9	5		3	1	2		1		1	2
299	Patchogue			3	6	2		7	3	4	1		1		4
300	Sag Harbor			4	3	2	1	3	1	2	2		1	1	4
301	Southampton			11	6	1		8	2	6	3		2		8
302	Other villages			4	7			1		1	1				6
303	Towns			94	134	37	14	73	30	43	22	5	6	4	87
304	—Central Islip State Hospital			20	58	67	3	19	7	12		2		3	37
305	—Kings Park State Hospital			6	20	17	2	27	18	9		1	3	1	26
306	SULLIVAN COUNTY	1		57	75	5	8	32	13	19	4	2	2	1	47
307	Villages			11	10	1	2	3		3					10
308	Towns	1		46	65	4	6	29	13	16	4	2	2	1	37
309	TIOGA COUNTY			59	55	10	12	18	8	10	7			2	41
310	Owego			11	9	2	7	4	3	1				1	5
311	Waverly			12	10			4	1	3	5				5
312	Other villages			10	13	1	1	2		2					3
313	Towns			26	23	7	4	8	4	4	2			1	28
314	TOMPKINS COUNTY	2		54	69	19	3	44	20	24	13	9	2		60
315	Ithaca	2		25	31	11	2	23	9	14	7	9	1		25
316	Villages			12	9	3		6	2	4	1		1		11
317	Towns			17	29	5	1	15	9	6	5				24

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	Causes of Death — (*Continued*)													
		Diseases of the nervous system			Diseases of the circulatory system		Diseases of the respiratory system				Diseases of the digestive system				
								Pneumonia							
		Cerebrospinal meningitis 61b, c	Acute anterior poliomyelitis 63a	Apoplexy and cerebral hemorrhage 64	Organic heart disease 79	Arterio-sclerosis 81	Bronchitis 89, 90	Total all forms 91, 92	Broncho 91	Lobar and unqualified 92	Diarrhea and enteritis under 2 years 104	Appendicitis 108	Hernia, intestinal obstruction 109	Cirrhosis of liver 113	Nephritis and Bright's disease 119, 120
318	ULSTER COUNTY	1	...	120	192	22	17	120	47	73	23	9	11	5	103
319	Kingston	...	...	32	68	6	8	36	15	21	12	4	5	1	43
320	Ellenville	1	...	8	11	2	...	6	4	2	...	1	1	...	1
321	Saugerties	...	...	4	20	2	...	9	3	6	...	1	...	...	6
322	Other villages	...	...	6	9	1	1	11	3	8	...	1	...	...	4
323	Towns	...	...	70	84	11	8	58	22	36	11	2	5	4	49
324	—Eastern New York Reformatory, Napanoch	...	...	...	...	...	...	...	...	...	...	...	...	...	...
325	WARREN COUNTY	...	...	51	78	19	5	42	19	23	8	5	11	4	39
326	Glens Falls	...	...	22	40	13	3	22	10	12	6	5	9	3	14
327	Villages	...	...	2	5	...	...	...	...	...	...	...	...	...	...
328	Towns	...	...	27	33	6	2	20	9	11	2	...	2	1	25
329	WASHINGTON COUNTY	1	...	54	102	28	9	57	25	32	7	3	...	6	64
330	Fort Edward	...	...	...	7	...	...	4	2	2	...	1	...	1	3
331	Granville	...	...	2	3	1	...	2	...	2	1	...	...	...	3
332	Hudson Falls	1	...	9	8	4	2	10	6	4	1	...	...	...	13
333	Whitehall	...	...	5	7	3	2	5	4	1	1	1	...	...	8
334	Other villages	...	...	10	22	10	3	7	3	4	...	1	...	2	12
335	Towns	...	...	28	55	10	2	29	10	19	4	...	...	3	25
336	—Great Meadow Prison, Comstock	...	...	...	...	...	...	...	...	...	...	...	...	...	...

337	WAYNE COUNTY			81	122	17	11	63	29	34	12	3	7	6	33
338	Clyde			9	6	1		2	2		3				5
339	Lyons			3	8			10	8	2				1	4
340	Newark			8	16	2		6	1	5	5				2
341	Other villages			12	16	2	4	11	6	5			4	2	1
342	Towns			49	76	12	7	34	12	22	4	3	2	3	21
343	—Newark State Custodial Asylum												1		
344	WESTCHESTER COUNTY	4	1	295	497	67	53	472	189	283	115	46	28	21	345
345	Mt. Vernon	1		33	70	10	1	64	30	34	12	7	3	2	47
346	New Rochelle			25	51	9	5	68	42	26	5	5	3	1	30
347	Ossining			6	17	2	1	18	4	14	4		1	1	12
348	—Sing Sing Prison							2		2					
349	Peekskill			19	30	4	7	18	6	12	8	3	2	1	19
350	White Plains			16	31	1	3	34	4	30	3	4	1	1	21
351	Port Chester	1		17	15	1	1	23	9	14	4	6	3		21
352	Yonkers		1	71	129	10	14	139	58	81	55	14	9	10	86
353	Bronxville			4	6	1		8	1	7		1			3
354	Dobbs Ferry			4	6		2	2	1	1	1	1			3
355	Hastings-on-Hudson	1		2	2	1	1	1	1		1				3
356	Irvington			3				3		3					4
357	Mamaroneck			3	7	4		7	2	5					13
358	Mt. Kisco			3	6			9	5	4	2	3	1		3
359	North Tarrytown			3	8		2	8	6	2	1				6
360	Pleasantville			2	2	2		3	1	2					2
361	Rye			6	5	1	2	3		3	1			1	5
362	Tarrytown	1		6	7		1	3		3		1	2	1	6
363	Scarsdale			3	2	1		2		2					
364	Tuckahoe			2	8			5	2	3	1				1
365	Other villages			15	16		2	11		11	4		1		11
366	Towns			52	79	20	11	41	17	24	13	1	2	3	49
367	—State Reformatory for Women, Bedford														
368	WYOMING COUNTY			43	68	16	4	42	14	28	3	3	6	2	27
369	Perry			7	10	4	2	9	1	8					3
370	Warsaw			12	8	3		3	2	1		2	3	1	6
371	Other villages			7	18			10	3	7	1			1	6
372	Towns			17	32	9	2	20	8	12	2	1	3		12
373	YATES COUNTY			51	46	5	4	19	5	14	3	1	2	2	17
374	Penn Yan			12	19	1	1	8	2	6	3		2		6
375	Other villages			6	8			1		1					1
376	Towns			33	19	4	3	10	3	7		1		2	10

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	CAUSES OF DEATH — (*Continued*) THE PUERPERAL STATE: Puerperal septicemia 137	Other puerperal affections 134–136, 138–141	MALFORMATIONS AND DISEASES OF EARLY INFANCY: Congenital malformations 150	Premature birth 151a	Congenital debility 151b	Other causes peculiar to early infancy 152–153	Old age 154	EXTERNAL CAUSES: Total accidents 164–181, 185–186	Accidents: Drowning 169	Railroad 175a	Automobile 175c	Other accidents	Suicides 155–163	Homicides 182–184	All other causes
1	**STATE OF NEW YORK**	384	1,040	1,363	4,370	1,332	1,959	838	7,351	726	523	1,439	4,663	1,189	448	17,700
2	New York City	174	534	649	2,149	833	1,109	289	3,619	331	89	763	2,436	670	325	7,914
3	Remainder of State	210	506	714	2,221	549	850	549	3,732	395	434	676	2,227	519	123	9,786
4	Cities	132	291	389	1,374	290	537	138	1,879	117	217	379	1,166	217	78	4,742
5	Villages	38	94	113	315	88	119	137	594	66	79	100	349	102	12	1,600
6	Towns	40	120	196	523	168	174	272	1,204	208	137	197	662	181	28	2,508
7	Institutional districts	......	1	16	9	3	20	2	55	4	1	......	50	19	5	936
8	ALBANY COUNTY	2	5	22	82	26	34	10	116	14	11	16	75	17	2	354
9	Albany	1	4	18	56	13	22	4	75	1	7	13	54	13	1	241
10	Cohoes	......	......	2	8	2	3	2	11	1	1	1	8	1	......	44
11	Watervliet	......	......	......	9	2	2	1	8	5	......	......	3	......	1	25
12	Green Island	......	......	2	......	1	2	2	1	1	......	......	......	......	......	4
13	Other villages	......	......	......	2	......	2	1	......	......	......	......	......	......	......	9
14	Towns	1	1	......	7	8	3	......	21	6	3	2	10	3	......	31
15	ALLEGANY COUNTY	3	3	4	15	4	6	4	28	3	1	3	21	9	1	76
16	Wellsville	2	1	1	1	2	1	......	3	......	......	......	3	1	1	12
17	Other villages	......	......	2	4	......	3	2	5	......	......	2	3	2	......	19
18	Towns	1	2	1	10	2	2	2	20	3	1	1	15	6	......	45
19	BROOME COUNTY	8	15	19	62	17	25	13	90	5	12	23	50	8	3	271
20	Binghamton	4	7	9	35	13	19	9	49	4	7	9	29	4	1	128
21	—Binghamton State Hospital	......	......	......	......	......	......	......	6	......	1	......	5	1	1	57

22	Endicott	1	2	2	7	3	1	1	4		1		3			9
23	Johnson City	3	3	2	11	1	3	1	12		2	8	2	1	1	22
24	Union			2	2				1	1						2
25	Other villages								4		1		3			9
26	Towns		3	4	7		2	2	14			6	8	2		44
27	CATTARAUGUS COUNTY	5	13	19	39	10	14	5	65	2	13	7	43	3	2	151
28	Olean	3	5	3	12	3	4	1	26		5	4	17		1	58
29	Salamanca		2	1	4	1	6	1	10	1	3	1	5	1	1	16
30	Gowanda*	1	1		1				3	1			2			3
31	Other villages		2	6	9		1	2	9		3	1	5	1		24
32	Towns	1	3	9	13	6	3	1	17		2	1	14	1		50
33	CAYUGA COUNTY	2	7	10	31	4	11	12	50	2	6	8	34	11	2	122
34	Auburn		5	7	22	3	8	10	25		3	6	16	6		70
35	—Auburn State Prison													2	2	3
36	Villages			1	2		1		7		1		6	1		15
37	Towns	2	2	2	7	1	2	2	18	2	2	2	12	2		34
38	CHAUTAUQUA COUNTY	5	7	4	42	16	29	30	91	7	8	20	56	9	6	259
39	Dunkirk			1	9	4	14	3	23	4		3	16	2	1	39
40	Jamestown	3	3	1	13	7	10	3	22		3	4	15	1	3	87
41	Falconer						1		2	1	1					4
42	Fredonia						1	1	1				1			8
43	Silver Creek							1	2				2			7
44	Westfield				1	1	1	2								7
45	Other villages			1	3	2		2	3				3	1		27
46	Towns	2	4	1	16	2	2	18	38	2	4	13	19	5	2	80
47	CHEMUNG COUNTY	3	9	9	34	9	14	6	45	5	6	7	27	4		108
48	Elmira	3	7	8	26	5	11	2	24		1	5	18	3		77
49	—Elmira State Reformatory															
50	Elmira Heights					1	2		2		1	1				7
51	Other villages		1		1			2	2		1		1	1		6
52	Towns		1	1	7	3	1	2	17	5	3	1	8			18
53	CHENANGO COUNTY	1	2		12		3	3	29	2	2	3	22	4		91
54	Norwich		1		2				7		2		5	1		27
55	Villages	1	1		4			1	9	2		1	6	1		24
56	Towns				6		3	2	13			2	11	2		39
57	—Woman's Relief Corps Home. Oxford															1
58	CLINTON COUNTY	1	8	7	35	8	12	9	44	6	3	5	30	3		103
59	Plattsburg	1	2	1	7	3	3	1	24	3	2	4	15			41
60	Villages		1	1	4	1		1	3		1		2			20
61	Towns		5	5	24	4	9	7	15	3		1	11	3		38
62	—Clinton Prison								2				2			1
63	—Dannemora State Hospital															3

* Gowanda, village, is located in two counties, Cattaraugus and Erie. No deaths were reported for that part located in Erie county.

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	CAUSES OF DEATH — (*Continued*)														
		THE PUERPERAL STATE		MALFORMATIONS AND DISEASES OF EARLY INFANCY					EXTERNAL CAUSES							
										Accidents						
		Puerperal septicemia (137)	Other puerperal affections 134–136, 138–141	Congenital malformations 150	Premature birth 151a	Congenital debility 151b	Other causes peculiar to early infancy 152–153	Old age 154	Total accidents 164–181, 185–186	Drowning 169	Railroad 175a	Automobile 175c	Other accidents	Suicides 155–163	Homicides 182–184	All other causes
64	COLUMBIA COUNTY	3	6	3	16	1	5	9	40	5	6	5	24	3	1	84
65	Hudson	2	2	1	11		1		12	1		4	7		1	33
66	—State Training School for Girls, Hudson						1									
67	Chatham				1	1		1	2				2			2
68	Other villages		3						3	2			1	1		10
69	Towns	1	1	2	4		3	8	23	2	6	1	14	2		39
70	CORTLAND COUNTY		1	5	15	3	2	10	19	1	2	3	13	5	1	68
71	Cortland			1	10	1	2	2	12		1	2	9	1		39
72	Homer			1		1		7	1				1	1		2
73	Other villages				1				2	1	1					5
74	Towns		1	3	4	1		1	4			1	3	3	1	22
75	DELAWARE COUNTY	3	5	2	12	9	4	14	32	1	1		30	12	2	87
76	Sidney				1									1		7
77	Walton				3				3				3	1		14
78	Other villages	2	1	1	2	4	2	3	4		1		3	3		22
79	Towns	1	4	1	6	5	2	11	25	1			24	7	2	44
80	DUTCHESS COUNTY	6	7	7	37	16	21	7	74	7	6	20	41	7	4	271
81	Beacon	3	1	3	4	2	2		4	1			3	2	1	17
82	—Matteawan State Hospital						1		1				1			15

83	Poughkeepsie	1	3	4	21	6	8		25	1	2	7	15	2		63
84	Wappingers Falls						1									7
85	Other villages	2			1	1		2	5			2	3	1		18
86	Towns		3		11	7	9	5	36	5	4	11	16	1	1	56
87	—Hudson River State Hospital								3				3	1	2	95
88	ERIE COUNTY	29	80	128	363	62	185	22	459	33	76	121	229	67	28	1,215
89	Buffalo	27	63	102	303	46	141	10	341	18	49	101	173	49	25	941
90	—Buffalo State Hospital							1	2				2	1		72
91	Lackawanna		2	2	10	3	3		31		3	4	24		1	16
92	—Our Lady of Victory Infant Home, Lackawanna		1	16	9	2	17									40
93	Tonawanda		2	2	3		1	1	4	3			1	1		14
94	Depew	1	1		1	1	5		3	1	2					1
95	East Aurora		1				1	1	1				1	1		7
96	Hamburg								3			1	2	2		3
97	Lancaster		1				4		1				1	1		7
98	Kenmore		1													3
99	Other villages		2		6	2	1	2	10	1	4		5	1		22
100	Towns	1	6	6	31	8	12	7	62	10	18	15	19	10	2	65
101	—Gowanda State Hospital								1				1	1		24
102	ESSEX COUNTY	3	4	7	15	3	8	6	20	1	2	2	15	3	1	71
103	Villages		3	1	9	1	1	1	7		1		6	1		21
104	Towns	3	1	6	6	2	7	5	13	1	1	2	9	2	1	50
105	—Raybrook Hospital for Incipient Tuberculosis															
106	FRANKLIN COUNTY	3	14	13	26	11	6	8	40	7	7	11	15	4		84
107	Malone		2	2	5	3	1		13	1	3	3	6	1		30
108	Saranac Lake*		1	1	4	1			1	1						5
109	Saranac Lake		1	2	7	1	1		1	1				1		8
110	Other villages	1	4	2	7	3		1	4	2		1	1			6
111	Towns	2	7	8	10	4	5	7	22	3	4	7	8	3		43
112	FULTON COUNTY	2	1	8	16		7	2	28	2	1	5	20	6	1	86
113	Gloversville		1	6	10		3		19		1	4	14	4	1	49
114	Johnstown				3		1		4				4	1		13
115	Villages	1			1		1		2			1	1			2
116	Towns	1		2	2		2	2	3	2			1	1		22
117	GENESEE COUNTY	5	3		19	6	1	8	43	3	8	5	27	1	2	93
118	Batavia	2	3		11	3	1	4	18		4	1	13		2	46
119	Le Roy				1				2	1		1				8
120	Other villages	1			3			1	6		2	2	2			5
121	Towns	2			4	3		3	17	2	2	1	12	1		34
122	GREENE COUNTY		1	1	8	2	2	9	27	6		4	17	5		56
123	Catskill			1	2	1		1	4	1			3	1		7
124	Other villages				1	1	1	1	2	1			1			9
125	Towns		1		5		1	7	21	4		4	13	4		40

* Saranac Lake, village, is located in two counties, Essex and Franklin. This total represents that part of the village located in Franklin county. The total for the entire village is shown in blackface type.

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	Causes of Death — (Continued): The puerperal state: Puerperal septicemia 137	The puerperal state: Other puerperal affections 134–136, 138–141	Malformations and diseases of early infancy: Congenital malformations 150	Malformations and diseases of early infancy: Premature birth 151a	Malformations and diseases of early infancy: Congenital debility 151b	Malformations and diseases of early infancy: Other causes peculiar to early infancy 152–153	Old age 154	External causes: Total accidents 164–181, 185–186	External causes: Accidents: Drowning 169	External causes: Accidents: Railroad 175a	External causes: Accidents: Automobile 175c	External causes: Accidents: Other accidents	External causes: Suicides 155–163	External causes: Homicides 182–184	All other causes
126	HAMILTON COUNTY		2		2			1	4	1			3			4
127	Towns		2		2			1	4	1			3			4
128	HERKIMER COUNTY	4	9	8	31	7	15	7	59	6	6	16	31	18	1	17
129	Little Falls	1	4	1	10	1	4	4	18	4	1	1	12	2	1	16
130	Dolgeville*								2			1	1	1		6
131	*Dolgeville*	1			1				2			1	1	1		7
132	Frankfort			1	4		3							2		5
133	Herkimer	1	1	2	2	3	4	3	7	1		1	5	2		19
134	Ilion	1	1		6		2		11		1	3	7	2		14
135	Mohawk				3	1			1				1	1		8
136	Other villages		1		1				5			3	2			12
137	Towns	1	2	4	5	2	2		15	1	4	7	3	8		37
138	JEFFERSON COUNTY	6	10	17	48	11	7	21	80	9	15	12	44	10		198
139	Watertown	5	4	10	23	5	5	4	41	2	12	10	17	3		92
140	Carthage			1	6	3		1	4				4	1		9
141	Other villages		3	3	5		2	5	15	1	3		11			47
142	Towns	1	3	3	14	3		11	20	6		2	12	6		50
143	LEWIS COUNTY	1	4	9	6	1	6	8	15	2	2		11	1		46
144	Lowville	1	1	2	1		1		3		1		2	1		5
145	Other villages			2	1		2	4	4	1			3			12
146	Towns		3	5	4	1	3	4	8	1	1		6			29

* Dolgeville, village, is located in two counties, Fulton and Herkimer. This total represents that part of the village located in Herkimer county. The total for the entire village is shown in blackface type.

147	LIVINGSTON COUNTY		5	6	10	3	4	8	43	2	3	10	28	6	1	106
148	Avon		1						2				2			3
149	Dansville		1	1	2	1	1		8			2	6	1		11
150	Mount Morris		2	1					5		1	1	3			8
151	Other villages			1	4	1	2	4	4			1	3	2		17
152	Towns		1	3	4	1	1	4	20		2	6	12	3	1	27
153	—Craig Colony, Sonyea								4	2			2			40
154	MADISON COUNTY		3	8	24	6	5	7	39	5	10	2	22	1	1	71
155	Oneida		1		8	3	2	1	14	1	5	2	6		1	20
156	Canastota			2	5		1	1	9		4		5			5
157	Other villages			2	2			2	3				3			16
158	Towns		2	4	9	3	2	3	13	4	1		8	1		30
159	MONROE COUNTY	14	33	50	196	11	54	11	200	18	23	39	120	40	6	591
160	Rochester	12	30	47	178	7	48		157	11	16	34	96	29	5	454
161	—Rochester State Hospital								4				4	1		41
162	Brockport		1				1	2	2			1	1	1		8
163	East Rochester								4		4					2
164	Fairport				1		1		1		1					5
165	Other villages	1	1		2	1		2	5	2		1	2			11
166	Towns	1	1	3	15	3	4	7	27	5	2	3	17	9	1	70
167	MONTGOMERY COUNTY	1	3	10	28	14	10	7	41	4	6	6	25	9	2	101
168	Amsterdam	1	1	6	17	10	9	3	27	2	4	5	16		1	62
169	Fort Plain		1		1	1	1	1	1	1				2	1	2
170	Other villages		1	1	4	1		2	9		1	1	7	4		19
171	Towns			3	6	2		1	4	1	1		2	3		18
172	NASSAU COUNTY	2	11	12	40	15	13	4	104	19	9	15	61	16	2	182
173	Glen Cove			1	2	1	2	1	3	1			2		1	6
174	Cedarhurst		1													2
175	Freeport				2	1	1		3	2			1	1		11
176	Lawrence								4	1	3				1	2
177	Hempstead				1	1								1		9
178	Lynbrook								3				3	1		10
179	Rockville Center		1		3		3		3				3	1		6
180	Mineola	2	3	1	6		1		25		3	5	17	2		30
181	Other villages			2	2	2		1	10	4			6	2		10
182	Towns		6	8	24	10	6	2	53	11	3	10	29	8		96
183	NIAGARA COUNTY	8	14	20	70	15	21	21	130	5	12	19	94	4	4	194
184	Lockport	1	3	4	12	1	3	3	23		4	4	15		1	49
185	Niagara Falls	6	9	9	43	10	12	4	62	2	7	9	44	2	2	73
186	North Tonawanda		1	3	6	4	1	3	27		1	3	23			27
187	La Salle	1		2	1		2		2	1		1				4
188	Other villages			1	3			2	4	1			3	1		4
189	Towns		1	1	5		3	9	12	1		2	9	2	1	37

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	CAUSES OF DEATH — (*Continued*) THE PUERPERAL STATE: Puerperal septicemia 137	Other puerperal affections 134–136, 138–141)	MALFORMATIONS AND DISEASES OF EARLY INFANCY: Congenital malformations 150	Premature birth 151a	Congenital debility 151b	Other causes peculiar to early infancy 152–153	Old age 154	EXTERNAL CAUSES: Total accidents 164–181, 185–186	Accidents: Drowning 169	Railroad 175a	Automobile 175c	Other accidents	Suicides 155–163	Homicides 182–184	All other causes
190	ONEIDA COUNTY	4	21	37	81	21	34	12	152	16	6	28	102	9	1	415
191	Rome			5	13	6	5	3	33	6		6	21	3		65
192	—Rome Custodial Asylum								2	1			1			17
193	Utica	3	12	22	53	7	15	3	64	3	3	9	49	4	1	173
194	—Utica State Hospital								1				1			41
195	Sherrill															1
196	Whitesboro		1	1	3				2			1	1			3
197	Other villages		1		3	1	1	2	10			2	8			31
198	Towns	1	7	9	9	7	13	4	40	6	3	10	21	2		84
199	ONONDAGA COUNTY	7	32	21	126	36	42	19	207	19	24	33	131	30	9	492
200	Syracuse	5	30	11	113	30	32	9	155	13	15	26	101	23	7	372
201	—State Institution for Feeble-minded, Syracuse															
202	Baldwinsville					1			1				1			8
203	East Syracuse	1		1	1	1	1									5
204	Solvay				3		1	1	5	1	1	1	2	1	1	4
205	Other villages		1	3	2		3	2	4		1		3	1		24
206	Towns	1	1	6	7	4	5	7	42	5	7	6	24	5	1	79
207	ONTARIO COUNTY	2	6	7	22	7	6	6	56	6	14	12	24	18	2	117
208	Canandaigua	2	2	1	1		2	4	18		5	4	9	1		32
209	Geneva		1	2	10	4	2	1	18	2	4	4	8	3	1	23
210	Villages		1		3	1	1		9		3	2	4	6	1	25
211	Towns		2	4	8	2	1	1	11	4	2	2	3	3		37

212	ORANGE COUNTY	10	14	18	47	13	23	5	111	17	21	17	56	7	4	258
213	Middletown	2	1	2	8	2	1	1	15	.....	3	3	9	3	.....	23
214	—Middletown State Hospital	.....	.....	.....	.....	1	.....	1	2	.....	.....	.....	2	1	.....	40
215	Newburgh	3	4	6	13	1	10	.....	18	1	1	1	15	1	1	64
216	Port Jervis	3	6	3	5	2	2	.....	14	.....	6	2	6	.....	1	25
217	Goshen	.....	.....	2	4	1	1	.....	.....	.....	.....	.....	.....	.....	.....	9
218	Highland Falls	1	1	.....	1	1	.....	.....	2	.....	1	1	.....	.....	.....	3
219	Walden	.....	.....	1	1	1	1	.....	2	.....	.....	1	1	.....	.....	6
220	Other villages	.....	.....	1	1	.....	.....	.....	4	.....	1	.....	3	1	.....	17
221	Towns	1	2	3	14	4	8	3	54	16	9	9	20	1	2	71
222	ORLEANS COUNTY	2	1	5	12	4	.....	6	24	2	1	9	12	1	.....	61
223	Albion	1	.....	1	1	.....	.....	3	9	1	.....	4	4	.....	.....	11
224	Medina	.....	1	1	1	2	.....	2	2	.....	.....	.....	2	.....	.....	14
225	Other villages	.....	.....	.....	2	1	.....	.....	2	.....	.....	.....	2	.....	.....	1
226	Towns	1	.....	3	8	1	.....	1	11	1	1	5	4	1	.....	35
227	OSWEGO COUNTY	2	5	10	27	10	11	6	47	11	3	3	30	11	1	118
228	Fulton	1	1	.....	5	1	1	1	7	2	.....	1	4	.....	.....	24
229	Oswego	.....	3	5	12	5	3	1	9	.....	.....	1	8	1	1	32
230	Villages	.....	1	1	2	1	.....	.....	7	2	1	.....	4	2	.....	15
231	Towns	1	.....	4	8	3	7	4	24	7	2	1	14	8	.....	47
232	OTSEGO COUNTY	4	4	4	21	8	4	20	40	3	10	4	23	12	1	93
233	Oneonta	2	1	2	4	2	1	.....	16	1	6	2	7	3	.....	28
234	Cooperstown	1	1	.....	.....	1	1	4	.....	.....	.....	.....	.....	.....	.....	10
235	Other villages	.....	.....	2	3	2	.....	2	6	1	1	2	2	2	.....	16
236	Towns	1	2	.....	14	3	2	14	18	1	3	.....	14	7	1	39
237	PUTNAM COUNTY	.....	.....	.....	.....	3	2	1	14	4	.....	1	9	.....	.....	29
238	Villages	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	8
239	Towns	.....	.....	.....	.....	3	1	1	14	4	.....	1	9	.....	.....	21
240	RENSSELAER COUNTY	3	8	14	41	21	17	13	72	6	5	13	48	19	2	260
241	Rensselaer	.....	1	2	.....	.....	1	.....	1	1	.....	.....	.....	1	.....	21
242	Troy	3	5	9	34	17	15	8	51	3	3	11	34	11	1	187
243	Hoosick Falls	.....	.....	.....	1	.....	.....	.....	2	.....	1	.....	1	1	.....	4
244	Other villages	.....	.....	.....	1	.....	.....	1	4	.....	.....	.....	4	.....	.....	10
245	Towns	.....	2	3	5	4	1	4	14	2	1	2	9	6	1	38
246	ROCKLAND COUNTY	2	4	8	16	7	8	1	40	11	7	10	12	7	1	87
247	Haverstraw	.....	.....	.....	.....	.....	.....	.....	2	.....	1	.....	1	1	.....	1
248	Nyack	2	1	1	1	.....	1	.....	13	4	1	3	5	.....	.....	13
249	Spring Valley	.....	.....	3	1	.....	.....	.....	1	.....	1	.....	.....	.....	.....	4
250	Suffern	.....	1	.....	3	1	2	.....	5	.....	.....	3	2	.....	.....	11
251	Other villages	.....	1	1	5	.....	2	.....	3	.....	1	1	1	.....	.....	11
252	Towns	.....	1	3	6	6	3	1	15	6	3	3	3	6	1	38
253	—Letchworth village, Thiells	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	8
254	—Hospital for Crippled and Deformed Children, West Haverstraw	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1

Table 16 — NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county:* 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	Causes of Death — (*Continued*): The Puerperal State: Puerperal septicemia 137	The Puerperal State: Other puerperal affections 134–136, 138–141	Malformations and Diseases of Early Infancy: Congenital malformations 150	Malformations and Diseases of Early Infancy: Premature birth 151a	Malformations and Diseases of Early Infancy: Congenital debility 151b	Malformations and Diseases of Early Infancy: Other causes peculiar to early infancy 152–153	Old age 154	External Causes: Total accidents 164–181, 185–188	External Causes: Accidents: Drowning 169	External Causes: Accidents: Railroad 175a	External Causes: Accidents: Automobile 175c	External Causes: Accidents: Other accidents	External Causes: Suicides 155–163	External Causes: Homicides 182–184	All other causes
255	ST. LAWRENCE COUNTY	5	10	27	60	12	19	26	61	11	3	3	44	9	2	206
256	Ogdensburg	3		12	8	2	8	1	16	3	2	1	10			49
257	—St. Lawrence State Hospital													2		33
258	Canton							1						1		7
259	Gouverneur		1	3			1	1	3				3			4
260	Massena	1		2	5		5	1	3	1			2	2	1	10
261	Potsdam		1		3	1		2	1		1					8
262	Other villages			1	4	1		1	2	1			1	1		6
263	Towns	1	8	9	40	8	5	19	36	6		2	28	3	1	89
264	SARATOGA COUNTY		7	8	21	9	7	6	43	1	10	7	25	8	3	107
265	Saratoga Springs		2	1	6	4	2		15		3	3	9	4	1	37
266	Mechanicville		1	1	2		3		5				5	2		15
267	Ballston Spa					3			2				2			5
268	Waterford			1	1	2	1	1	1				1			8
269	Other villages		2		4				2				2		1	10
270	Towns		2	5	8		1	5	18	1	7	4	6	2	1	32
271	SCHENECTADY COUNTY	8	13	10	42	18	15	10	79	7	20	16	36	10	7	165
272	Schenectady	7	8	7	40	16	14	6	54	4	7	13	30	7	6	143
273	Scotia		1		1				1		1					7
274	Towns	1	4	3	1	2	1	4	24	3	12	3	6	3	1	15

275	SCHOHARIE COUNTY	3	2		11	4	3	4	17	2	1	2	12	1		44
276	Villages				1		1	1	3	1			2			9
277	Towns	3	2		10	4	2	3	14	1	1	2	10	1		35
278	SCHUYLER COUNTY		1	3	6		3	4	14		1	3	10	1		22
279	Watkins				1		3		2				2			6
280	Other villages			2	2				2		1		1			5
281	Towns		1	1	3			4	10			3	7	1		11
282	SENECA COUNTY		2	6	10	2	2	2	13	1	1	1	10	8		106
283	Seneca Falls		2		6	1			3				3	1		17
284	Waterloo			2	1		1	2	1				1	2		14
285	Other villages													1		5
286	Towns			4	3	1			6	1	1	1	3	2		17
287	—Willard State Hospital						1		3				3	2		53
288	STEUBEN COUNTY	5	3	15	29	7	13	24	61	2	18	10	31	9	1	182
289	Corning	1	1	2	8	4	5	5	20		5	6	9	2		30
290	Hornell	1	1	4	5	2	2	3	11		5	1	5	2	1	26
291	Bath	2		3	3			1	1				1			15
292	Other villages		1	1	2		4	4	8	1	2	2	3	1		33
293	Towns	1		5	11	1	2	11	20	1	6	1	12	4		71
294	—Soldiers' and Sailors' Home								1				1			7
295	SUFFOLK COUNTY	4	12	26	43	13	7	8	102	21		19	62	20	4	542
296	Amityville			3	1	1								1	1	19
297	Babylon		1	2	1		1		3			3				6
298	Greenport		1	1	1		1		4			2	2			13
299	Patchogue	1			4				2				2	2		15
300	Sag Harbor		1	1	1				1				1			5
301	Southampton	1	4	3	3		1		6	1			5	1		12
302	Other villages		2					1	2				2	1		6
303	Towns	2	3	16	32	12	4	7	80	20		14	46	8	3	128
304	—Central Islip State Hospital								2				2	5		232
305	—Kings Park State Hospital								2				2	2		106
306	SULLIVAN COUNTY		2	4	8	2	3	3	30	7	1	3	19	1	1	61
307	Villages				1		1	1	7			1	6			8
308	Towns		2	4	7	2	2	2	23	7	1	2	13	1	1	53
309	TIOGA COUNTY	1		3	10	2	2	9	21		3	5	13	1		67
310	Owego	1			2			3	5			3	2			17
311	Waverly			1	2				3				3			10
312	Other villages				2				1			1				10
313	Towns			2	4	2	2	6	12		3	1	8	1		30
314	TOMPKINS COUNTY	2	6	6	15	3	4	5	25	2		4	19	3		83
315	Ithaca	1	2	2	12	2	2	1	15	1		3	11	1		43
316	Villages		2		2				1				1	1		10
317	Towns	1	2	4	1	1	2	4	9	1		1	7	1		30

Table 16—NEW YORK STATE CITIES AND VILLAGES OF 2,500 AND OVER: *Deaths classified by broad age groups and important causes; also totals for other villages and towns in each county, and for each county*, 1920 — (Continued)

Line number	STATE AND SUBDIVISIONS, BY COUNTIES	CAUSES OF DEATH — (*Continued*)														
		THE PUERPERAL STATE		MALFORMATIONS AND DISEASES OF EARLY INFANCY					EXTERNAL CAUSES							
										Accidents						
		Puerperal septicemia 137	Other puerperal affections 134–136, 138–141	Congenital malformations 150	Premature birth 151a	Congenital debility 151b	Other causes peculiar to early infancy 152–153	Old age 154	Total accidents 164–181, 185–186	Drowning 169	Railroad 175a	Automobile 175c	Other accidents	Suicides 155–163	Homicides 182–184	All other causes
318	ULSTER COUNTY	2	11	10	24	8	8	17	64	19	4	6	35	6	2	162
319	Kingston	1	6	4	10	2	4	7	23	2	1	2	18	3	.....	72
320	Ellenville	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	1	1	1	14
321	Saugerties	.....	1	1	1	2	1	1	.....	.....	.....	.....	.....	.....	.....	4
322	Other villages	.....	.....	.....	2	.....	.....	1	5	2	1	.....	2	.....	.....	7
323	Towns	1	4	5	11	4	3	7	35	15	2	4	14	2	1	65
324	—Eastern New York Reformatory, Napanoch	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
325	WARREN COUNTY	.....	3	7	15	6	8	4	27	7	1	4	15	1	1	67
326	Glens Falls	.....	1	5	6	3	6	1	9	.....	1	1	7	1	.....	40
327	Villages	.....	.....	.....	.....	.....	.....	1	1	1	.....	.....	.....	.....	.....	1
328	Towns	.....	2	2	9	3	2	2	17	6	.....	3	8	.....	1	26
329	WASHINGTON COUNTY	1	2	2	14	6	6	12	27	5	1	2	19	7	.....	96
330	Fort Edward	.....	.....	.....	1	.....	1	1	3	.....	.....	.....	3	1	.....	8
331	Granville	.....	.....	.....	2	3	.....	1	1	.....	.....	.....	1	.....	.....	8
332	Hudson Falls	.....	1	1	1	.....	1	.....	3	.....	.....	.....	3	3	.....	8
333	Whitehall	.....	.....	.....	.....	.....	2	1	3	2	.....	.....	1	.....	.....	8
334	Other villages	1	.....	.....	2	.....	.....	3	3	.....	.....	.....	3	1	.....	13
335	Towns	.....	1	1	8	3	2	6	13	3	1	2	7	2	.....	51
336	—Great Meadow Prison, Comstock	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....

337	WAYNE COUNTY	2	2	6	17	7	6	20	32	3	5	2	22	6	1	108
338	Clyde			1	1		1		1			1				4
339	Lyons			1	1	1	1	6	9		2	1	6	2		10
340	Newark				2	2		2	2				2	1		13
341	Other villages			1	2	1		7	3		1		2			15
342	Towns	2	2	3	11	3	4	5	16	3	2		11	3	1	63
343	—Newark State Custodial Asylum								1				1			3
344	WESTCHESTER COUNTY	20	46	38	156	27	64	8	254	23	15	65	151	24	6	486
345	Mt. Vernon	6	8	3	22	2	6	1	22			5	17	2	1	61
346	New Rochelle	4	4	1	19	4	4	4	26	5		5	16	1	1	46
347	Ossining		2		2		2		9		2	5	2	1		19
348	—Sing Sing Prison								16				16			3
349	Peekskill	3	3	4	9		4		15	1		4	10	2		22
350	White Plains	2	6	5	11	1	5	1	11	2		4	5	4		32
351	Port Chester	2	3	4	9	3	7		13	1	1	3	8		1	23
352	Yonkers	1	10	11	46	9	22		50			12	38	3	2	131
353	Bronxville		1	1	5	1	1		4	1		2	1			9
354	Dobbs Ferry		1		5				14	1		7	6			8
355	Hastings-on-Hudson			1	1	2	1		1	1						4
356	Irvington								1	1						3
357	Mamaroneck		1		2				6		1	1	4	1		6
358	Mt. Kisco	1		1	3	2	4		6			3	3			9
359	North Tarrytown				1			1	3	2	1			1		8
360	Pleasantville				1		1									3
361	Rye			1	1				5	2	2		1	1		2
362	Tarrytown		3		6				8	1	1	1	5	2		7
363	Scarsdale								2				2			2
364	Tuckahoe			1	2		1									2
365	Other villages		3	1	4	1	1		9	1	3	3	2		1	16
366	Towns	1	1	4	7	2	5	1	33	4	4	10	15	6		70
367	—State Reformatory for Women, Bedford															
368	WYOMING COUNTY	1	3	8	9	2	4	11	31	5	2	6	18	8	1	51
369	Perry			1	1				3	2			1	2		4
370	Warsaw			1	1	1		1	9			3	6	1		15
371	Other villages	1			1		1	1	5	2			3	1	1	13
372	Towns		3	6	6	1	3	9	14	1	2	3	8	4		19
373	YATES COUNTY		1	3	4	1	4	5	13	1		1	11			41
374	Penn Yan		1				1	1	3				3			16
375	Other villages			1				1	4				4			3
376	Towns			2	4	1	3	3	6	1		1	4			22

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920

NOTE.— Important State institutions and certain other large institutions, whose inmates are individual cities and towns in which these institutions are located, are exclusive of the deaths
[District number is obtained by prefixing County Number to Number before such district

District number	DISTRICT	BIRTHS: Living births	BIRTHS: Stillbirths	DEATHS: Total deaths at all ages	DEATHS, AGES AT DEATH: Under 1	DEATHS, AGES AT DEATH: 1-4	DEATHS, AGES AT DEATH: 60 and over	CAUSE, IMPORTANT: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
01	ALBANY COUNTY	3,543	129	2,779	305	129	1244	65	6	1,509	13	334	3
01	**Albany, city**	2,294	74	1,786	178	73	785	45	4	553	2	247	2
02	**Cohoes, city**	422	24	329	44	16	133	4	...	486	5	7	1
03	**Watervliet, city**	295	9	211	29	17	83	3	...	108	3	8	...
50	Berne	18	...	22	2	...	13	...	...	2	...	...	...
51	Bethlehem	36	5	53	2	1	27	2	...	21	...	21	...
52	Coeymans	50	2	29	3	1	21	1	...	73	1	5	...
23	*Ravena, village*	*41*	*1*	*19*	*6*	*2*	*6*	*2*	...	*121*	*2*	...	...
53	Colonie	198	10	107	24	7	36	4	...	14	...	18	...
*54	(Green Island)	...	...	...	...	...	...	...	...	...	...	...	...
20	*Green Island, village*	*72*	*2*	*66*	*8*	*7*	*38*	*2*	...	*94*	...	*3*	...
55	Guilderland	32	...	34	1	3	19	...	...	13	...	2	...
21	*Altamont, village*	*10*	...	*19*	*1*	...	*11*	...	...	*2*	...	*1*	...
56	Knox	13	...	16	1	...	14	...	...	...	...	8	...
57	New Scotland	15	2	27	1	...	21	1	...	9	...	13	...
22	*Voorheesville, village*	*4*	...	*10*	*2*	...	*7*	...	...	*2*	...	*1*	...
58	Rensselaerville	21	...	30	1	2	16	...	1	...	...	...	...
59	Westerlo	22	...	21	2	...	14	1	1	11	...	...	...
02	ALLEGANY COUNTY	647	30	585	54	12	336	29	3	260	3	52	2
50	Alfred	10	...	10	1	...	5	...	...	3	...	4	...
20	*Alfred, village*	*1*	*1*	*6*	...	...	*4*	...	...	*2*	...	*1*	...
51	Allen	16	...	7	2	...	4	1	...	14	...	...	...
52	Alma	15	1	6	1	...	5	3	1	...	...	...	...
53	Almond	18	1	12	1	...	9	...	...	...	...	...	...
54	Amity	18	...	16	2	...	9	...	...	36	1	1	...
21	*Belmont, village*	*15*	...	*30*	*3*	*1*	*19*	...	...	*5*	...	...	...
55	Andover	15	...	7	...	...	4	...	...	1	...	4	...
22	*Andover, village*	*20*	*1*	*24*	*2*	*3*	*14*	...	...	*5*	...	*11*	*1*
56	Angelica	7	...	16	...	1	10	...	...	2	...	...	...
23	*Angelica, village*	*5*	...	*23*	...	*1*	*12*	...	...	*1*	...	...	...
57	Belfast	14	1	27	...	1	19	...	...	6	...	...	...
58	Birdsall	7	...	7	...	...	4	...	...	...	...	...	...
59	Bolivar	16	1	10	2	...	4	1	...	5	...	...	...
24	*Bolivar, village*	*23*	*1*	*16*	*2*	...	*10*	...	...	...	...	...	...
60	Burns	12	...	11	1	...	6	...	...	...	...	...	...
25	*Canaseraga, village*	*6*	...	*12*	...	...	*10*	...	...	...	...	*2*	...
61	Caneadea	21	2	12	2	...	6	2	...	8	...	2	...
30	*Oramel, village*	...	...	...	...	...	...	...	...	...	...	...	...
62	Centerville	16	1	11	...	...	7	...	1	12	1	...	...
63	Clarksville	18	1	7	1	...	3	...	...	1	...	1	...
64	Cuba	8	...	8	2	...	4	...	...	3	...	...	...
26	*Cuba, village*	*37*	*1*	*32*	*4*	*1*	*18*	*2*	...	*20*	...	*2*	...
65	Friendship	7	...	8	...	...	7	3	...	20	...	...	...
27	*Friendship, village*	*15*	...	*20*	*3*	...	*15*	*2*	*1*	*5*	...	...	...
66	Genesee	21	2	10	1	...	7	...	...	6	...	1	...
67	Granger	5	1	5	...	...	4	...	...	2	...	1	...
68	Grove	11	1	10	1	...	8	...	...	6	1	1	...
69	Hume	27	1	22	3	...	15	...	...	6	...	11	...
70	Independence	21	1	14	2	...	9	...	...	...	...	...	...
71	New Hudson	13	...	11	...	...	8	...	...	...	...	...	...
72	Rushford	18	1	11	1	...	8	...	...	46	...	1	...

* Coterminous with

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement from each State

mainly nonresidents, have been constituted separate registration districts, and the deaths in the in these institutions, the latter appearing at end of county.
e. g. 101=Albany city, cities (c.) in bold face, villages (v.) in *italics*, towns in Roman type.

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28–35: Pulmonary, 28–29		Tuberculosis, 28–35: Other forms, 30–35		Pneumonia, 91–92: Broncho, 91		Pneumonia, 91–92: Lobar and unqualified, 92		Cancer, 39–45	Diarrhea and enteritis (under 2 years), 104	All other cause[illegible]	District number
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
592	11	223	22	3178	68	352	194	43	41	365	123	418	181	242	55	1,820	01
434	6	157	12	2,319	41	225	135	34	29	253	78	240	94	165	22	1,196	01
21	1	19	3	560	12	64	25	2	2	42	16	85	30	21	14	199	02
15		18	2	8	9	32	18	3	4	23	10	29	19	16	8	122	03
		3	2	39							1	11	3	3	1	12	50
10		1		68	3	7	4			6	3	4	3	3	1	36	51
35	1	3		13		3	2			3	1	6	1	3		20	52
46	*2*	*12*		*12*						*12*		*6*	*4*	*1*		*10*	*23*
14	1	9	3	10		5	2	2	4	10	8	15	9	7	6	67	53
																	*54
8		*1*		*79*		*10*	*1*	*1*		*12*	*3*	*7*	*5*	*6*	*3*	*48*	*20*
5						1	3		1			3	2	3		25	55
				5	*2*	*1*	*2*	*1*	*1*	*1*		*1*		*3*		*11*	*21*
				8								2	2			14	56
3				30	1					1	1	2	3	3		19	57
1				*27*		*1*				*2*	*1*	*1*		*2*		*7*	*22*
						2	1				1	4	6	5		16	58
						1	1					2		1		18	59
285	4	34	1	993	50	22	17	4		86	18	105	32	36	6	408	02
4	1			14	1					3	1	1		1		6	50
6		*1*		*15*	*1*	*1*				*6*	*1*	*2*	*2*	*1*		*1*	*20*
				4						1		1		1		6	51
		1									1					4	52
6				66	1	3	1			4	1	2	1			8	53
8		1		73	3					3		15		1		11	54
				99	*6*	*1*				*3*		*6*		*1*		*22*	*21*
4				12							1	3		1		5	55
1		*3*		*84*	*1*	*3*	*1*	*1*	*1*	*5*		*3*		*3*	*3*	*14*	*22*
4				26						4	1	2	2	1		12	56
				61	*6*	*1*				*2*		*1*	*1*			*16*	*23*
		1	1	10	2									1		23	57
				14	3		2			3						2	58
4				10	1							4	1		1	7	59
		5		*28*		*1*				*2*		*5*	*3*	*1*		*12*	*24*
1				5	2		1			3				2		6	60
				7	*1*					*2*				*2*		*9*	*25*
1		2		57	1					3		3		1		10	61
																	30
3				38						3	1	5	2			6	62
					1											6	63
				2												8	64
5		*1*		*28*			*2*	*1*	*1*	*3*	*1*			*4*	*1*	*23*	*26*
20				17						1		2				8	65
23				*57*	*1*		*1*				*1*	*2*	*1*	*2*		*13*	*27*
		1							1		1		1	1		6	66
15				18						5		5	2			3	67
																9	68
21	1	3		98		2				13	1	11	7	3		10	69
3							1						1		1	11	70
				7							2		1	1		7	71
17				58						3		4	1	1		9	72

Green Island, village.

Table 17 — New York State (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS: Living births	BIRTHS: Stillbirths	DEATHS: Total deaths at all ages	AGES AT DEATH: Under 1	AGES AT DEATH: 1–4	AGES AT DEATH: 60 and over	CAUSE — IMPORTANT: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	ALLEGANY COUNTY — (*Concl'd*)												
73	Scio	30	1	21	3	....	6	2	....	2	....	2	....
74	Ward	6	1	8	1	....	5	....	....	....	....	4	1
75	Wellsville	21	4	19	2	1	12	5	....	2	....	....	....
28	*Wellsville, village*	*91*	*3*	*94*	*8*	*3*	*37*	*8*	....	*36*	....	*3*	....
76	West Almond	6	....	4	2	....	....	....	....	2	....	....	....
77	Willing	18	1	11	....	....	7	....	....	....	....	....	....
78	Wirt	10	1	4	1	....	2	....	....	3	....	....	....
29	*Richburg, village*	*9*	....	*3*	....	....	*2*	....	....	....	....	....	....
03	BROOME COUNTY	2,867	109	1,830	254	100	816	29	7	1,733	21	245	6
01	**Binghamton, city**	1,677	52	934	152	72	376	17	7	1,256	18	98	4
50	Barker	22	1	23	1	1	13	....	....	6	....	12	....
51	Binghamton	17	1	4	1	....	1	....	....	....	....	....	....
52	Chenango	24	1	37	1	1	12	2	....	4	....	4	....
53	Colesville	48	1	35	5	....	18	2	....	1	....	4	....
54	Conklin	7	....	8	1	....	4	....	....	....	....	....	....
55	Dickinson	18	3	57	2	2	34	....	....	....	....	1	....
20	*Port Dickinson, village*	*18*	....	*10*	....	....	*5*	....	....	....	....	*1*	....
56	Fenton	16	1	14	2	....	7	....	....	5	....	13	....
57	Kirkwood	15	1	15	2	....	7	....	....	....	....	....	....
58	Lisle	11	1	17	1	2	8	....	....	....	....	....	....
21	*Lisle, village*	*2*	....	*7*	*1*	....	*5*	....	....	....	....	....	1
59	Maine	20	3	17	3	....	10	....	....	2	....	....	....
60	Nanticoke	9	....	5	....	....	4	....	....	....	....	....	....
61	Sanford	21	2	14	1	....	6	....	....	....	....	3	....
22	*Deposit, village*	*29*	....	*22*	*1*	....	*13*	*1*	....	*2*	....	*1*	....
[22*	*Deposit, village*	*48*	*1*	*35*	*2*	*1*	*19*	*1*	....	*4*	....	*1*	....
62	Triangle	15	....	14	1	1	9	....	....	....	....	1	....
23	*Whitney Point, village*	*8*	....	*9*	....	....	*8*	*1*	....	*7*	....	....	....
63	Union	91	5	43	11	2	16	....	....	57	....	6	....
24	*Endicott, village*	*312*	*6*	*93*	*30*	*7*	*24*	*4*	....	*238*	*2*	*17*	....
25	*Johnson City, village*	*325*	*22*	*156*	*27*	*11*	*49*	*2*	....	*95*	*1*	*73*	1
26	*Union, village*	*74*	*4*	*34*	*5*	*1*	*18*	....	....	*43*	....	*5*	....
64	Vestal	39	3	23	5	....	16	....	....	17	....	5	....
65	Windsor	41	2	14	....	....	13	....	....	....	....	1	....
27	*Windsor, village*	*8*	....	*14*	*1*	....	*13*	....	....	....	....	....	....
10	Binghamton State Hospital	....	....	211	....	....	127	....	....	....	....	....	....
04	CATTARAUGUS COUNTY	1,553	60	1,028	129	44	494	17	1	701	7	140	1
01	**Olean, city**	544	23	306	47	15	103	4	1	237	6	22	....
02	**Salamanca, city**	219	9	131	18	11	43	1	....	47	....	2	....
50	Allegany	31	....	24	2	....	11	....	....	122	....	14	....
20	*Allegany, village*	*23*	*1*	*20*	*2*	*1*	*13*	....	....	*71*	....	*48*	....
51	Ashford	32	2	17	3	....	11	....	....	....	....	....	....
52	Carrollton	10	....	8	1	1	4	....	....	4	....	....	....
21	*Limestone, village*	*4*	....	*10*	*1*	*2*	*4*	....	....	....	....	....	....
53	Cold Spring	19	....	11	....	....	6	1	....	....	....	4	....
54	Conewango	17	....	7	1	....	5	....	....	2	....	....	....
22	*East Randolph, village* (78)	*3*	*1*	*3*	....	....	*2*	....	....	....	....	1	....
55	Dayton	20	2	12	....	....	11	....	....	....	....	1	....
30	*South Dayton, village*	*10*	....	*12*	*1*	....	*6*	....	....	....	....	....	....
56	East Otto	13	....	13	2	1	8	1	....	....	....	....	....
57	Elko	4	....	1	....	....	....	....	....	....	....	....	....
58	Ellicottville	26	1	6	1	....	3	....	....	....	....	....	....
23	*Ellicottville, village*	*17*	....	*16*	*4*	....	*9*	*1*	....	*1*	....	....	....

* Deposit, village, located in two counties, Broome and

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement from each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES																	
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
						Pulmonary, 28-29		Other forms, 30-35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
9	2	3		7	7					4		1	1			11	73
3		1		29	1					2						6	74
4		2		3	1						1	2				17	75
122		7		*11*	*9*	*10*	7	*2*	*1*	*6*	*3*	*25*	*3*	7		*64*	*28*
1				20			1			2						3	76
											1		2			8	77
				13	1											3	78
		2		7												*3*	*29*
744	**21**	**135**	**17**	**1,974**	**100**	**137**	**78**	**14**	**8**	**126**	**62**	**507**	**108**	**145**	**53**	**1,204**	**03**
363	**8**	**65**	**6**	**1,109**	**56**	**84**	**31**	**7**	**3**	**24**	**32**	**373**	**51**	**81**	**28**	**609**	**01**
				121	6				1			2	1	3		12	50
													1		1	2	51
				109	2	1	17			1		6	2	4	1	11	52
							2						4	4		25	53
						1							1		1	6	54
	3	3					4				3		6	6	1	34	55
				12		*1*	*1*				*1*		*1*	*1*		*6*	*20*
7		6	1	44								1		3	1	9	56
		1			1									1		13	57
		3				1					2	1		1	1	13	58
4		*1*			*1*					*1*		*1*				*5*	*21*
				13		1	1			1		2	2	3	1	10	59
				25	2							2				3	60
1				91			2					1	1			11	61
1				*122*	*1*	*3*	*2*			*3*	*1*	*6*		*2*		*17*	*22*
1				*199*	*2*	*5*	*3*			*4*	*1*	*7*		*3*	*1*	*26*	**22]*
		1	1	92	3	1					5		1			4	62
				84										*3*		*6*	*23*
42	3	6	1	19	5	5		2		7	1	12	1		3	29	63
152	*6*	*19*	*2*	*2*	*10*	*18*	*2*	*2*	*1*	*11*	*1*	*17*	*3*	*6*	7	*53*	*24*
125	*1*	*8*	*3*	*87*	*1*	*18*	4	*2*	*2*	*69*	*6*	*45*	*14*	*15*	*6*	*101*	*25*
29		*14*	*1*	*22*	*4*	*3*		*1*		*5*	*1*	*9*	*3*	*3*		*22*	*26*
20		1			2					1			1		2	18	64
		1											1			13	65
											1			*5*		*8*	*27*
		6	2	22	6		12		1	3	8	29	14	4		164	10
254	**14**	**159**	**15**	**1,025**	**30**	**68**	**44**	**4**	**9**	**111**	**35**	**112**	**56**	**66**	**11**	**739**	**04**
45	**2**	**66**	**5**	**220**	**5**	**36**	**7**	**2**	**7**	**64**	**13**	**52**	**23**	**24**	**2**	**211**	**01**
20	**6**	**9**	**2**	**20**	**4**	**4**	**4**			**3**	**5**	**11**	**7**	**12**	**3**	**88**	**02**
7		2		169		1	7			1		4				17	50
19		*2*		*88*		*3*	*1*			*3*	*1*	*4*		*1*		*17*	*20*
8		1		63								2	2			15	51
				3	1		1			2	1					5	52
					1		*1*				*3*	*1*	*2*			*3*	*21*
		1											1			10	53
4				21								1		1		6	54
		4		*1*												*3*	*22*
		1		11								1	2	2		8	55
2		*2*		*9*			*1*			*1*	*1*	*2*				*10*	*30*
	1			5		1	1					1	1			10	56
																1	57
					1											5	58
				7		*1*	*1*					*3*		*2*		*13*	*23*

Delaware. Total for entire village given in bracketed line

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other dise ses, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS: Living births	BIRTHS: Stillbirths	DEATHS: Total deaths at all ages	DEATHS, AGES AT DEATH: Under 1	DEATHS, AGES AT DEATH: 1–4	DEATHS, AGES AT DEATH: 60 and over	CAUSES, IMPORTANT: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	CATTARAUGUS CO. — (*Concluded*)												
59	Farmersville	21		12	1		6			75		1	
60	Franklin	27		8	2		3			1			
24	*Franklinville, village*	37		39	6	1	24			6			
61	Freedom	17		13	2		5			1			
62	Great Valley	29	2	21	3		11					2	
63	Hinsdale	12		10		1	7			6			
64	Humphrey	6	1	13			10			4		5	
65	Ischua	16	1	6			5			3			
66	Leon	16	1	10	2		4			1		8	
67	Little Valley	6		4			4						
25	*Little Valley, village*	22	3	21	3		11	1					
68	Lyndon	9		10	1		4			3			
69	Machias	31		41	2	2	31						
70	Mansfield	18		6	3		2					1	
71	Napoli	14	2	6			5			1			
72	New Albion	17		6			3						
26	*Cattaraugus, village*	22	1	16	1		11	1		4			
73	Olean	27		16	4	3	2			17	1	2	
74	Otto	21	2	18	5		9			3		2	
75	Perrysburg	22		21	2	1	7			4		3	
32	*Perrysburg*	4		1			1			1			
76	Persia	11		5			3					1	
(27)	*Gowanda, village*	46	5	32	1	3	18	1		1		5	
[27*	*Gowanda, village (1458)*	46	5	32	1	3	18	1		2		5	
77	Portville	23		12	1	1	7			47		13	1
28	*Portville, village*	12		12			11			4		2	
78	Randolph (22)	13	1	5	1		4	2		1			
29	*Randolph, village*	18	1	18	1	1	15			1			
79	Red House	11		9			3						
80	Salamanca	7		7	2		3			6		3	
81	South Valley	3		6			5	2					
82	Yorkshire	18		12	3		8	1		17			
31	*Delavan, village*	5	1	15			15	1		11			
05	CAYUGA COUNTY	1,191	42	1,060	112	59	535	29	10	495	5	107	1
01	**Auburn, city**	764	26	580	81	47	217	14	5	330	4	54	1
50	Aurelius	17		15		2	6					5	
20	*Cayuga, village*	6		4			3						
51	Brutus	16	1	10	1		6					3	
21	*Weedsport, village*	19		33	1	1	27			9		8	
52	Cato	17	1	20	1	2	8			2			
22	*Cato, village (56)*	2		8	1		3			2		2	
23	*Meridian, village*			6			4			8			
53	Conquest	8		14	1		12			1		3	
54	Fleming	14	1	14			10			3		1	
55	Genoa	30	1	35	4		29						
56	Ira (22)	6		19		1	11			7	1	2	
57	Ledyard	12		14	1		10			10			
24	*Aurora, village*	4		2			1			1		1	
58	Locke	9		14	1		12	1		4		1	
59	Ments	19		7	1		4		1	2			
25	*Port Byron, village*	14		16		1	9	9	1	28			
60	Montezuma	7		4			2			1			
61	Moravia	7		6			5	1					
26	*Moravia, village*	19	4	29	2	1	22						

* Gowanda, village, located in two counties, Cattaraugus and Erie. Total for entire village given in

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement from each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35: Pulmonary, 28-29		Tuberculosis, 28-35: Other forms, 30-35		Pneumonia 91-92: Broncho, 91		Pneumonia 91-92: Lobar and unqualified, 92		Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
1		6	1	108	2	1				3	1	1	1			7	59
					1	1								1		6	60
1		*10*	*1*	*1*	*1*	*3*	*2*			*5*	*3*			*3*	*1*	*28*	*24*
20				21		2	1			3	1	4	2	1	1	7	61
47	1	2	1	23	1	2			1	4		2		3	1	13	62
		3		3		1										10	63
9	1			38		2			1	2			1	1		9	64
				8						1		3		1		5	65
				4	2	1				2						8	66
																4	67
7							*1*			*3*		*1*		*2*		*18*	*25*
				1	1		1			1						8	68
11		4	2	2	2							3	1	5	1	30	69
													1			5	70
2				5	1						1					4	71
													1			5	72
5				*1*								*2*	*1*	*1*		*14*	*26*
6	3	12	1	15	1		4			2	1		1			4	73
2																18	74
				28		1	7							1		13	75
												1				1	32
		1	1									1	1			3	76
4		*22*		*17*		*5*		*2*		*5*	*1*	*3*	*2*	*2*	*1*	*26*	*27*
6		*31*		*43*		*6*		*2*		*28*	*1*	*3*	*2*	*2*	*1*	*26*	*27}*
5		6	1	5	1							1	2	1		6	77
1		*1*											*1*			*11*	*28*
3				33							1	2	1		1	2	78
6		*1*		*27*							*1*	*3*				*17*	*29*
				1	4		2			1			1			2	79
2							1									6	80
						1	1							1		4	81
13		2		44	1					4	1	2				10	82
4		*1*		*23*		*2*				*1*		*1*	*1*	*1*		*13*	*31*
175	17	116	18	612	28	36	47	1	12	51	34	171	56	90	27	715	05
112	15	104	17	164	12	24	34		11	17	26	125	40	42	16	357	01
			1	124						2		2	2	1		11	50
				85						*3*		*1*		*1*		*3*	*20*
7				23	1	1	1			1		1		1		7	51
7		*1*		*31*	*1*				*1*	*1*	*1*	*5*	*1*	*5*	*1*	*23*	*21*
		1		17	1		1			1	1	3	2	2	2	11	52
							1					*1*		*1*		*6*	*22*
																5	*23*
		1		18		2	1			2	2			1	1	9	53
		3		57						7	1	1	1			12	54
11	1	1			4	2				2	1			6	1	22	55
				1	1		1				1					15	56
11										1		2	1		1	12	57
4				*7*						*1*		*1*				*2*	*24*
2				3	1					2		2		1		12	58
												3			1	5	59
1						*2*						*2*			1	14	*25*
							1			1		1		1		2	60
3						2					1	2				5	61
3								*1*		*1*		*1*		*3*		*26*	*26*

bracketed line.

Table 17 — New York State (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Deaths, ages at death: Under 1	Deaths, ages at death: 1–4	Deaths, ages at death: 60 and over	Causes, important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	CAYUGA Co. — (*Concluded*)												
62	Niles	20	....	14	2	....	9	....	....	10	....	....	....
63	Owasco	15	1	22	3	....	12	....	....	15	....	3	....
64	Scipio	19	....	18	....	....	15	....	....	9	....	2	....
65	Sempronius	10	....	4	1	....	2	....	....	4	....	....	....
66	Sennett	24	....	35	2	....	27	1	....	....	....	6	....
67	Springport	7	....	13	....	....	7	1	1	16	....	1	....
27	*Union Springs, village*	*1*	*1*	*15*	*1*	....	*11*	....	....	*5*	....	*5*	....
68	Sterling	25	....	17	1	....	11	1	1	13	....	1	....
28	*Fairhaven, village*	*13*	....	*9*	*1*	....	*6*	....	....	*9*	....	*3*	....
69	Summer Hill	11	1	9	2	....	5	1	1	....	....	....	....
70	Throop	15	2	9	1	....	7	....	....	....	....	1	....
71	Venice	24	2	17	2	1	10	....	....	3	....	5	....
72	Victory	17	1	19	1	3	12	....	....	3	....	....	....
10	Auburn State Prison	....	....	10	....	....	....	....	....	....	....	....	....
06	**CHAUTAUQUA COUNTY**	**2,444**	**86**	**1,612**	**185**	**61**	**811**	**40**	**7**	**1,063**	**5**	**169**	**3**
01	**Dunkirk, city**	**567**	**19**	**248**	**51**	**11**	**86**	**2**	**2**	**539**	**3**	**46**	**2**
02	**Jamestown, city**	**813**	**29**	**538**	**70**	**22**	**237**	**20**	**3**	**269**	**2**	**64**	....
50	Arkwright	15	....	4	....	....	2	2	1	4	....	....	....
51	Busti	18	....	19	2	....	9	....	....	....	....	3	1
20	*Lakewood, village*	*7*	*1*	*18*	....	*1*	*6*	....	....	....	....	*2*	....
52	Carroll	28	1	16	2	1	7	....	....	....	....	....	....
53	Charlotte	16	2	6	....	....	4	....	....	11	....	....	....
21	*Sinclairville, village (62)*	*6*	....	*18*	....	....	*14*	....	....	*2*	....	*1*	....
54	Chautauqua	42	1	68	2	....	55	....	....	3	....	....	....
22	*Mayville, village*	*17*	....	*15*	*2*	....	*8*	....	....	....	....	....	....
34	*Chautauqua, village*	*2*	*2*	*10*	....	....	*8*	....	....	....	....	....	....
55	Cherry Creek	17	....	9	....	....	8	1	....	....	....	....	....
23	*Cherry Creek, village*	*10*	....	*14*	*1*	....	*11*	*1*	....	*2*	....	....	....
56	Clymer	24	....	19	1	....	10	....	....	1	....	....	....
57	Dunkirk	7	....	9	2	....	3	....	....	....	....	....	....
58	Ellery	19	4	21	3	2	13	....	....	1	....	....	....
33	*Bemus Point, village*	*1*	....	*4*	....	....	*2*	....	....	*1*	....	....	....
59	Ellicott	21	1	14	....	....	6	....	....	....	....	....	....
24	*Celoron, village*	*14*	....	*9*	*1*	....	*6*	....	....	*1*	....	*3*	....
25	*Falconer, village*	*48*	*2*	*36*	*2*	*3*	*12*	*1*	....	*3*	....	*1*	....
60	Ellington	20	....	18	....	....	15	....	....	....	....	1	....
61	French Creek	14	....	12	....	....	9	....	....	....	....	....	....
62	Gerry (21)	17	1	17	3	1	12	....	....	6	....	....	....
63	Hanover	56	1	18	1	1	13	....	....	....	....	1	....
26	*Forestville, village*	*9*	....	*19*	*1*	*1*	*12*	....	....	*5*	....	*6*	....
27	*Silver Creek, village*	*79*	*2*	*32*	*1*	*6*	*16*	....	....	*4*	....	*1*	....
64	Harmony	14	1	23	1	1	13	....	....	5	....	....	....
28	*Panama, village*	*5*	....	*8*	....	....	*8*	....	....	....	....	....	....
65	Kiantone	9	....	5	....	1	3	....	....	....	....	....	....
66	Mina	14	1	16	4	1	9	1	....	....	....	....	....
76	North Harmony	17	1	11	1	1	7	....	....	....	....	....	....
67	Poland	15	1	20	3	....	12	....	....	2	....	1	....
68	Pomfret	46	1	32	3	....	14	4	1	12	....	3	....
29	*Fredonia, village*	*122*	*4*	*52*	*6*	....	*34*	*5*	....	*111*	....	*20*	....
69	Portland	37	1	28	4	2	14	....	....	4	....	1	....
30	*Brocton, village*	*27*	*1*	*18*	*5*	*1*	*10*	....	....	*23*	....	....	....
70	Ripley	53	1	36	4	2	16	....	....	11	....	....	....
71	Sheridan	24	3	24	3	....	10	1	....	25	....	14	....
72	Sherman	26	....	11	....	....	5	1	....	1	....	....	....
31	*Sherman, village*	*12*	....	*12*	....	....	*6*	....	....	*5*	....	....	....
73	Stockton	39	1	23	1	1	19	1	....	9	....	1	....

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement from each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES										Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35 Pulmonary, 28-29		Tuberculosis, 28-35 Other forms, 30-35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
2				1						2		2	1	1	1	11	62
7		3		10		1	1			1		2		2	2	18	63
1				1	1					3		1	1	5		11	64
																4	65
		1		24	1					1		1		3		31	66
				8	1	1	1			2		3	2			8	67
2				*4*			*1*							*2*	*1*	*11*	*27*
				14			1					1	1	1		18	68
				2										*2*		*7*	*28*
							1						1			6	69
					2							1				7	70
2	1	1		12								7	2	4		10	71
				6	1	1	1						1	4		12	72
					1		1							1		7	10
601	6	254	14	2,868	103	133	64	25	5	96	44	361	99	109	34	1,119	06
87	1	53	9	12	14	30	8	1	1	12	7	40	10	14	8	169	01
420	3	158	2	2,084	43	70	26	18	2	28	13	264	39	45	10	350	02
								1					1			2	50
2		1		20	2					1		1	2			14	51
							1						*2*			*15*	*20*
				2	2					2		3	4	1		9	52
				18										1		5	53
		2		*33*	*2*					*1*		*2*		*2*		*14*	*21*
3		1			1								1	5	1	60	54
					1						*2*		*1*	*1*		*10*	*22*
3																*10*	*34*
				9						4				2		7	55
3				*4*	*1*		*1*			*4*	*1*	*1*				*11*	*23*
							1		1				1	1		15	56
		1			3										1	5	57
3		2		40	1					3	1			1	2	16	58
1				*9*		*1*	*1*					*2*		*1*		*2*	*33*
					2	1							2			10	59
		2		*13*						*1*	*2*				*1*	*6*	*24*
3		*7*	*1*	*46*	*2*	*2*	*4*			*1*	*1*	*9*	*5*	*2*		*21*	*25*
				59	1					4		4	3			31	60
							1							1		10	61
		1		72	2	1				1		3	1	1		13	62
5				25		3	1			1	2	1	1	2	1	11	63
		1		*39*	*1*	*1*				*1*	*1*	*2*	*1*	*1*		*15*	*26*
4		*7*	*1*	*1*	*2*	*5*	*2*	*2*		*2*		*3*	*3*	*5*	*1*	*18*	*27*
5				71	5	1					1	2	3	3	1	10	64
		2		*57*												*8*	*28*
											1		2	1		1	65
	1				1						2	1	2	2		8	66
9				76	3		1					1		1		6	76
		7	1	4	1	1	2			1		4	2			14	67
				8		1	4	1					1	2		2	68
20		*5*		*98*		*7*	*2*			*1*	*1*	*5*	*3*	*5*	*3*	*38*	*29*
7				9	3	1				4	1			1	1	22	69
11		*1*		*10*	*2*	*1*	*1*			*5*	*2*			*1*		*12*	*30*
9	1	1					1			1				1	2	31	70
				40	2	2	1				1	1	2	2	2	14	71
					1		1									9	72
						1	*1*			*1*	*2*	*2*	*1*			*8*	*31*
				1	1	1				2	1	1				21	73

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS: Living births	BIRTHS: Stillbirths	DEATHS: Total deaths at all ages	DEATHS, AGES AT DEATH: Under 1	DEATHS, AGES AT DEATH: 1–4	DEATHS, AGES AT DEATH: 60 and over	CAUSE, IMPORTANT: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	CHAUTAUQUA CO. — (*Concluded*)												
74	**Villenova**	17	1	16	1		8			2			
75	Westfield	16	1	16			9						
32	*Westfield, village*	*64*	*2*	*50*	*4*	*2*	*27*			*1*			
07	CHEMUNG COUNTY	1,462	56	869	109	22	437	22	3	1,036	4	30	
01	**Elmira, city**	1,168	47	581	84	21	274	16	3	726	4	20	
50	Ashland	4	1	5			5						
20	*Wellsburg, village*	*9*		*10*	*1*		*8*			*8*			
51	Baldwin	14	1	4			3						
52	Big Flats	25	1	21	3		14			3		3	
53	Catlin	10		9	2		5			3			
54	Chemung	27	1	18	2		13			8		1	
55	Elmira	17		35			11						
21	*Elmira Heights, village*	*83*	*1*	*33*	*8*		*7*			*91*			
56	Erin	10	1	8	1		5			14		3	
57	Horseheads (21)	22		45	3		26	5		18		3	
22	*Horseheads, village*	*11*	*2*	*22*			*16*			*77*			
58	Southport	25	1	35	2		22	1		43			
59	Van Etten	11		11		1	7			12			
23	*Van Etten, village*	*3*		*7*	*1*		*5*			*15*			
60	Veteran	23		22	2		16			18			
10	Elmira State Reformatory			3									
08	CHENANGO COUNTY	620	26	597	29	19	384	8		42		41	
01	**Norwich, city**	179	11	135	9	8	65	1		5			
50	Afton	18		10	2	1	4					1	
20	*Afton, village*	*16*		*15*	*1*		*9*						
51	Bainbridge	14		15	1		10					2	
21	*Bainbridge, village*	*25*	*1*	*17*			*13*	*2*		*1*		*3*	
52	Columbus	10		13	1		7			1		3	
53	Coventry	12		5			5			7			
54	German	7		4			1						
55	Greene	34		26	1		21			12		2	
22	*Greene, village*	*19*	*2*	*25*		*1*	*19*					*3*	
56	Guilford	30	1	20	1		19	1		4		3	
57	Lincklaen	14		9		1	8	1					
58	McDonough	10	2	14		1	10						
59	New Berlin	14		12			7					4	
23	*New Berlin, village*	*15*	*1*	*29*			*21*			*3*			
60	North Norwich	10		8			7					1	
61	Norwich	12		11	2	1	6						
62	Otselic	16		19			15						
63	Oxford	22	3	18	2	2	13			2			
25	*Oxford, village*	*19*	*1*	*34*	*4*	*1*	*17*	*3*		*3*		*7*	
64	Pharsalia	8	1	5		1	3					4	
65	Pitcher	9		13		1	7						
66	Plymouth	18		5			5					1	
67	Preston	10	1	41	1		37						
68	Sherburne	33	1	17		1	6			1			
26	*Earlville, village*	*3*		*5*			*5*						
*26**	**Earlville**, *village (2,156)*	*13*		*10*			*8*						
27	*Sherburne, village*	*15*		*11*			*8*					*3*	
69	Smithville	9	1	13	3		8						
70	Smyrna	16		10	1		7			3		4	
28	*Smyrna, village*	*3*		*8*			*4*						
10	Woman's Relief Corps Home			21			21						

* Earlville, village, located in two counties, Chenango and Madison.

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES										Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Broncho, 91		Lobar and unqualified, 92					
						Pulmonary, 28-29		Other forms, 30-35									
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
		2		8						5	1	3	1	1		13	74
5							1					1	1			14	75
1					*4*	*3*	*3*	*2*	*1*	*12*	*1*	*5*	*4*	*3*		*34*	*32*
353	5	49	3	60	20	78	49	9	3	82	29	78	19	88	8	638	07
287	4	42	2	52	15	51	20	5	1	55	18	62	15	63	7	429	01
											1					4	50
				1		*2*	*1*			*1*	*1*			*2*		*6*	*20*
1					1	1		1								3	51
9		2			1	1				1		1		1		19	52
					1			1					1			7	53
1						1	1			2	1	4		2		14	54
							20						2	1		12	55
33		*1*		*5*	*2*	*14*	*3*			*8*	*1*	*5*		*3*	*1*	*23*	*21*
3														1		7	56
3	1	3	1			3	1	1	1	2	3	1	1	3		34	57
		1								*2*				*3*		*19*	*22*
6				1		1	1			2	2	3		4		28	58
				1				1	1	6	1	1		2		7	59
1										*2*				*1*		*6*	*23*
9						4				1		1		2		20	60
							2				1						10
84	2	47	4	1,015	23	25	16	2	5	42	15	63	29	52	7	444	08
		16	3	141	3	8	1	1		9	7	5	10	8	3	100	01
		2	1	4	1									2		6	50
																15	*20*
2				9		1					1	4	2	1		11	51
9		*7*		*109*	*1*	*4*				*4*		*6*	*1*	*1*		*14*	*21*
		1		49	3	2				3		3	1		1	8	52
				6												5	53
				13								1				4	54
		1		81	2	1					1	3				23	55
		1		*90*	*3*		*2*					*2*		*6*		*14*	*22*
19		3		93		1	2		1	3		5	2	1		23	56
										1				2		7	57
	1			5	3					3		4	3	1		6	58
2				81	2	1						1				10	59
19		*1*		*107*						*6*		*4*	*2*	*6*		*21*	*23*
				6	2	1					1		2			3	60
1		7		13								2	1	1	1	8	61
4		1				1	2			1				2		15	62
23		4		29		1			1			4		1		16	63
5	*1*			*41*			*1*	*1*	*1*	*3*		*1*		*2*		*29*	*25*
											1	1		1		3	64
		2		33	1	1				2		3	2			10	65
												1		1		4	66
		1		3	1				2		2		1	3	1	31	67
						1	6			2	1	4	1	2		7	68
				5		*1*						*1*		*2*		*3*	*26*
				49		*1*				*1*		*5*	*1*	*3*		*6*	*26*]
				3		*1*				*3*				*2*		*9*	*27*
				16			1			1				1		11	69
				50	1							5	1	1	1	6	70
				28			*1*			*1*	*1*	*3*		*1*		*5*	*28*
														4		17	10

Total for entire village given in bracketed line.

Table 17 — New York State (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Ages at death: Under 1	Ages at death: 1-4	Ages at death: 60 and over	Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
09	CLINTON COUNTY	1,145	57	700	121	39	288	8	2	605	3	123	5
01	**Plattsburg, city**	289	18	233	25	13	97	3	1	376	1	20	...
50	Altona	56	1	28	10	3	6	...	...	1	...	11	...
51	Ausable	19	1	10	1	...	7	...	...	...	...	...	...
20	*Keeseville, village*	19	...	13	2	...	7	...	...	...	...	...	...
[20*	*Keeseville, village*	31	...	27	6	...	16	...	...	...	...	...	...
52	Beekmantown	30	1	18	1	1	10	1	...	3	...	3	...
53	Black Brook	43	2	26	7	1	8	...	...	14	...	1	...
54	Champlain	56	1	26	7	1	10	...	...	5	...	2	...
21	*Champlain, village*	40	...	18	4	1	5	1	...	5	...	1	...
22	*Rouses Point, village*	49	2	33	4	6	11	...	...	1	...	14	1
55	Chazy	71	8	37	7	...	16	2	...	50	...	9	...
56	Clinton	31	1	20	6	2	9	...	...	1	...	...	...
57	Dannemora	67	2	15	9	...	2	...	...	2	...	21	1
23	*Dannemora, village*	33	1	13	3	...	5	...	...	1	...	...	...
58	Ellenburgh	81	5	23	3	5	11	...	...	22	1	17	3
59	Mooers	54	...	26	5	3	13	...	...	17	...	...	...
24	*Mooers, village*	5	1	12	...	...	8	...	...	17	...	1	...
60	Peru	38	3	30	3	1	19	...	...	21	1	7	...
61	Plattsburg	39	4	24	7	2	8	...	...	30	...	2	...
62	Saranac (23)	88	5	48	14	1	17	1	1	8	...	8	...
63	Schuyler Falls	38	1	23	3	...	16	...	...	31	...	6	...
10	Dannemora State Hospital	...	...	13	...	...	2	...	...	...	...	...	...
11	Clinton Prison	...	...	11	...	...	...	...	...	...	...	...	...
10	COLUMBIA COUNTY	735	25	638	52	19	377	41	4	512	6	107	...
01	**Hudson, city**	316	11	203	22	8	101	5	...	120	2	58	...
50	Ancram	15	1	11	...	1	6	1	...	26	...	1	...
51	Austerlitz	8	1	9	...	...	7	...	...	2	...	...	...
52	Canaan	12	1	9	2	...	4	...	...	...	...	...	...
53	Chatham	28	...	38	2	...	26	...	...	1	1	...	...
20	*Chatham, village*	31	...	25	8	1	14	19	...	5	...	9	...
54	Claverack	20	...	36	1	...	24	1	...	29	...	...	...
21	*Philmont, village*	16	1	28	2	1	16	1	...	117	1	...	...
55	Clermont	13	...	12	2	...	5	...	...	...	...	...	...
56	Copake	22	...	18	2	...	14	2	...	37	...	...	...
57	Gallatin	13	1	12	1	...	7	...	...	12	...	...	...
58	Germantown	28	2	14	1	1	11	...	...	9	...	1	...
59	Ghent (20)	12	...	44	1	1	32	5	2	32	...	1	...
60	Greenport	30	3	13	1	2	6	...	...	4	...	5	...
61	Hillsdale	13	...	17	...	...	15	...	...	4	...	2	...
62	Kinderhook	13	...	16	1	1	8	2	...	...	...	...	...
22	*Kinderhook, village*	10	...	12	...	1	7	1	...	6	...	...	...
23	*Valatie, village*	21	...	16	1	1	8	...	...	3	...	1	...
63	Livingston	14	...	14	1	...	10	...	...	25	1	...	...
64	New Lebanon	18	1	21	1	...	16	...	...	...	...	1	...
65	Stockport	40	2	36	8	...	21	1	1	21	1	27	...
66	Stuyvesant	27	1	20	1	...	12	3	1	37	...	...	...
67	Taghkanic	11	...	11	3	1	7	...	...	23	...	1	...
10	State Training School for Girls, Hudson	4	...	3	1	...	...	...	...	...	...	...	...
11	CORTLAND COUNTY	616	28	480	35	14	287	10	2	91	1	194	1
01	**Cortland, city**	290	19	231	19	8	131	1	...	42	1	99	...
50	Cincinnatus	21	1	12	...	...	5	...	...	...	...	...	...
51	Cortlandville	46	2	29	1	...	19	2	...	4	...	10	...
20	*Homer, village (55)*	39	1	49	1	1	31	2	2	...	...	35	...
21	*McGrawville, village*	14	...	19	1	...	13	...	...	1	...	2	...

* Keeseville village, located in two counties, Clinton and

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES																		
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All Other causes	District number
						Pulmonary, 28-29		Other forms, 30-35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
91	2	45	3	400	29	47	56	7	13	23	17	39	21	39	36	474	09
61	2	9	1	41	5	22	22	1	5	7	2	15	5	18	8	163	01
		1		1	2		1	1	1	1	3	2	1		5	15	50
							2									8	51
							1							2	2	8	20
						1	1							2	3	21	*20]
1		1				2	2				1			2	1	12	52
		2		1	2		1		1	1		1	1		2	19	53
		5		15	1		1	1	2	1	2			1		19	54
		3		1	1	1			1			1	3	2	1	10	21
		1			3	2	4				2		1		3	19	22
9		6		144	1	3	4			5		1	1	4	1	26	55
14				17	2					2	2	2	1	1	1	13	56
		1		143	3	2					2	1		2	1	6	57
				2	1	2							1			11	23
		4	1		2	2	1			1	1	3			2	12	58
1		5	1		1	1	1			1			2	1	1	19	59
						2	2			1		1				10	24
		2		19		1				1	1	1		2	2	24	60
		1			1	1	1	1							2	20	61
3		4		16	3	2		2	2	2	1	8	2	3	3	33	62
2					1	4	1	1				3	1	1	1	18	63
							5						2			6	10
							7		1							3	11
105	2	24	3	364	14	55	35	6	8	49	25	40	16	52	8	465	10
12	1	9	1	14	6	13	13	2	3	19	9	9	1	16	5	146	01
5		1		62		2	1			9	1	2		1		8	50
		1											2	1		6	51
											1			2		6	52
		1	1		2	4	4				2			3		25	53
		5				2	1			1	1	1	1	5		17	20
	1					1	1	1	1		1	3	1	5		26	54
				1		6	2	1		2	1	7	2	3		19	21
14				43			2	1							1	9	55
9		1		10		1	1			1				1		16	56
				31	1					3		2	1			10	57
13		4	1	56		3	1	1								12	58
				14	1	3				1	2	4	2			37	59
4				4	1	2			1	2	1				1	9	60
		1			1					1	1	1	1	2		12	61
3					1	2			1		1	3	1			12	62
3				5		1	1					2		1		10	22
2						2	1			3				3		12	23
9				56		1							1			12	63
									1					2		18	64
20		1		42		8	3		1	5	3			3		24	65
1				5		1	2					6	3	3		11	66
10				21	1	3				2	1			1	1	7	67
							2									1	!0
72	2	25	4	375	22	35	15	5	8	42	22	72	26	45	5	327	11
26	1	20	2	191	11	28	8	3	6	32	9	48	17	24	3	149	01
3				51							1	1				11	50
3				5	1	1		1				3	1	3		24	51
2				2	2	1	2				2	3	1	4		36	20
16				6			2	1	1	1	1	3	1	2		12	21

Essex. Total for entire village given in bracketed line.

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS: Living births	BIRTHS: Stillbirths	DEATHS: Total deaths at all ages	DEATHS, AGES AT DEATH: Under 1	DEATHS, AGES AT DEATH: 1–4	DEATHS, AGES AT DEATH: 60 and over	CAUSES, IMPORTANT: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	CORTLAND CO. — (*Concluded*)												
52	Cuyler	24	...	8	1	2	4	...	...	5	...	2	...
53	Freetown	8	...	4	...	...	4	...	...	1	...	...	...
54	Harford	9	...	13	...	...	7	...	...	12	...	...	...
55	Homer (20)	30	1	15	4	...	8	...	...	...	...	10	1
56	Lapeer	11	1	2	...	1	1	2	...	...	...	1	...
57	Marathon	15	...	12	1	1	5	...	...	2	...	...	...
22	*Marathon, village*	18	...	17	1	...	14	1	...	3	...	1	...
58	Preble	8	1	16	...	1	12	...	...	...	...	3	...
59	Scott	12	1	7	1	...	5	...	...	5	...	6	...
60	Solon	10	...	6	1	...	3	...	...	1	...	...	...
61	Taylor	14	...	9	...	...	7	1	...	...	...	4	...
62	Truxton	15	...	7	...	...	3	...	...	2	...	16	...
63	Virgil	20	...	16	3	...	11	1	...	...	...	1	...
64	Willett	12	1	8	1	...	4	...	...	13	...	1	...
12	DELAWARE COUNTY	813	17	662	52	14	398	14	1	411	...	55	3
50	Andes	34	2	21	1	...	12	...	...	4	...	1	...
20	*Andes, village*	4	...	8	...	...	7	...	...	...	...	...	...
51	Bovina	16	...	9	...	...	6	...	...	2	...	1	...
52	Colchester	66	...	24	3	1	15	5	...	20	...	4	...
53	Davenport	23	...	19	3	...	13	1	...	3	...	4	...
54	Delhi	20	...	19	1	...	14	...	...	15	...	3	...
21	*Delhi, village*	28	...	34	2	...	21	...	1	24	...	2	...
55	Deposit	13	...	13	1	...	7	...	...	...	...	...	...
22*	*Deposit, village* (0361)	19	1	13	1	1	6	...	...	2	...	...	...
56	Franklin	23	...	23	1	2	14	...	...	4	...	2	...
23	*Franklin, village*	6	...	11	...	...	8	...	...	...	...	...	...
57	Hamden	27	1	19	2	...	11	...	...	27	...	...	...
58	Hancock	48	2	44	2	...	28	2	...	22	...	2	...
24	*Hancock, village*	26	...	29	3	1	18	...	...	4	...	...	...
59	Harpersfield	14	...	11	1	1	7	...	...	7	...	5	...
25	*Stamford, village* (66)	14	2	23	1	1	9	...	...	41	...	...	...
60	Kortright	33	1	25	1	...	16	...	...	5	...	1	...
61	Masonville	15	...	18	1	...	12	...	...	...	...	...	...
62	Meredith	25	2	15	2	1	11	1	...	12	...	4	1
63	Middletown	49	...	37	4	...	19	...	...	10	...	3	...
30	*Fleischmanns, village*	11	...	5	...	...	4	...	...	5	...	...	...
26	*Margaretville, village*	4	...	12	...	...	7	...	...	7	...	1	...
64	Roxbury	45	...	34	3	1	21	...	...	43	...	...	...
65	Sidney	24	...	19	2	1	12	...	...	1	...	2	...
27	*Sidney, village*	42	2	35	3	...	21	...	...	2	...	...	...
66	Stamford (25)	16	...	10	...	1	5	...	...	6	...	...	...
28	*Hobart, village*	11	1	12	3	...	6	...	...	3	...	...	...
67	Tompkins	41	1	21	2	2	10	2	...	9	...	11	2
68	Walton	40	1	27	1	1	13	...	...	40	...	3	...
29	*Walton, village*	76	1	72	8	...	45	3	...	93	...	6	...
13	DUTCHESS COUNTY	1,693	53	1,774	162	60	878	24	4	492	4	109	1
01	**Beacon, city**	206	5	169	24	11	79	6	1	11	1	4	...
02	**Poughkeepsie, city**	813	31	516	78	22	235	5	2	167	1	48	1
50	Amenia	23	2	17	3	1	5	1	1	23	...	1	...
51	Beekman	17	...	10	1	1	8	...	...	...	...	...	...
52	Clinton	17	...	15	...	...	13	...	...	...	...	2	...
53	Dover	32	...	28	7	1	12	...	...	77	...	...	...
54	East Fishkill	42	1	32	5	4	14	...	...	3	...	6	...

* See Deposit, Broome county,

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES																		
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
						Pulmonary, 28-29		Other forms, 30-35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
										2	2					6	52
2						1						1				4	53
				73	1					1	1			2		9	54
					1						1	1	1	3	1	7	55
2												1				2	56
									1	2	2					9	57
2					*1*	*2*						*3*		*3*		*13*	*22*
1		1	1		1	1				2	1	4	2	2		9	58
9														1		6	59
3	1			1							1	4		1		3	60
				8	2	1	1									6	61
3		2		24						1			2			5	62
							2			1	1		1		1	11	63
		2	1	14	2											5	64
52	4	40		1,238	34	34	26	3	1	45	20	93	38	46	7	482	12
1				43	1					2	1		2	2	1	14	50
											1		*2*			5	*20*
						1					1	5		1		7	51
		4		83	1	1				2		1		2	1	20	22
		6		6			1					6	2			16	53
		1		9			2					2	2	1		14	54
				9	*3*	*2*				*3*	*1*	*1*	*3*	*2*		*24*	*21*
				58	3					2	1	1		2		7	55
				77	*1*	*2*	*1*			*1*		*1*		*1*	*1*	*9*	**22*
4				8	1					2	1			1		20	56
1												*2*		*1*		*10*	*23*
5		1		270	5	1				6	1	8		3		10	57
		3		121	7	2	2				1	9	1	2		31	58
				176			*2*				*1*	*9*	*2*	*6*		*19*	*24*
				2						*1*		*3*	*2*			*9*	5)
				3		*2*	*4*				*1*	*3*	*2*	*1*		*15*	*25*
		1			1		2					1	1			21	60
		7		4								3	2			16	61
3						2	1			2	2	2	1	3	1	6	62
	1				1	2	4			2		4	4	1		26	63
5						*2*										*5*	*30*
					1					*2*		*3*		*1*		*10*	*26*
5	1			46	2	2				1		1	3	2	1	25	64
		2		2				1	1		2	2		3		13	65
		5		*1*		*1*	*1*			*1*	*1*	*1*		*2*		*31*	*27*
				6	2	1						1	1			7	66
				1								*2*		*2*		*10*	*28*
		1		8	1	4	3	2		3	3	3	2		1	9	67
13		2		104	2	2				5	1	6	2	4		18	68
15	*2*	*7*		*201*	*2*	*7*	*3*			*10*	*1*	*15*	*4*	*4*	*1*	*55*	29
314	21	83	5	1,303	54	147	176	10	12	124	69	179	104	120	1	1,186	13
10	6	12		109	6	18	8	6	3	22	5	9	11	14	1	113	01
125	9	38	3	363	20	85	23	3	4	25	19	105	47	42	11	337	02
8	1	13	1	54		1	1		1	1		2		2	1	9	50
4				8	1	1				2	1	2	1	2		5	51
		1					2					1	1	1		11	52
21	1			25	2		1			3	1	1	1	5		17	53
24				1	3	6	3			1	1	2	2	1	2	20	54

for complete total.

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Deaths (ages at death): Under 1	Deaths (ages at death): 1–4	Deaths (ages at death): 60 and over	Causes (Important): Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	DUTCHESS CO. — (*Concluded*)												
55	Fishkill	47	2	26	8	1	8	1	...	17	...	...	...
20	*Fishkill, village*	5	...	9	...	...	7	...	...	...	...	...	...
56	Hyde Park	26	...	34	1	...	19	3	...	3	...	3	...
57	LaGrange	9	1	16	...	2	12	...	...	6	...	3	...
58	Milan	6	...	11	...	...	10	5	...	...	...	...	...
59	Northeast	14	...	19	2	1	11	...	...	33	...	1	...
21	*Millerton, village*	8	...	10	1	...	7	...	...	63	...	1	...
60	Pawling	10	...	17	...	2	10	...	...	3	...	...	...
22	*Pawling, village*	14	...	16	2	...	10	...	...	1	...	...	...
61	Pine Plains	16	...	18	2	1	11	...	...	1	...	1	...
62	Pleasant Valley	11	...	12	2	...	8	...	...	4	...	3	...
23	*Pleasant Valley, village*	3	...	5	...	...	5	...	...	9	...	...	...
63	Poughkeepsie	129	2	144	10	7	55	...	...	3	...	10	...
24	*Wappingers Falls, village* (68)	64	1	41	4	1	25	1	...	1	...	5	...
64	Red Hook	28	2	18	1	...	14	...	...	5	1	4	...
25	*Red Hook, village*	9	...	10	...	...	7	...	...	...	...	...	...
26	*Tivoli, village*	13	...	16	1	1	8	...	...	...	...	...	...
65	Rhinebeck	20	...	37	2	2	23	...	...	11	...	1	...
27	*Rhinebeck, village*	19	2	39	1	...	24	...	...	2	...	3	...
66	Stanford	18	1	27	2	1	21	...	...	20	...	...	...
67	Union Vale	13	...	11	1	...	5	...	...	1	...	...	...
68	Wappinger (24)	21	1	14	3	1	8	...	...	...	...	1	...
69	Washington	28	...	32	...	...	22	...	...	13	...	8	...
28	*Millbrook, village*	12	1	8	...	...	6	...	...	15	1	4	...
10	Matteawan State Hospital	...	...	42	1	...	14	...	...	...	...	...	...
11	Hudson River State Hospital	2	1	355	...	...	165	2	...	...	...	...	...
14	**ERIE COUNTY**	**16,457**	**653**	**9,190**	**1797**	**671**	**2917**	**163**	**33**	**6,387**	**69**	**874**	**29**
01	**Buffalo, city**	**13,317**	**553**	**7,249**	**1369**	**549**	**2158**	**95**	**26**	**4,573**	**41**	**687**	**22**
02	**Lackawanna, city**	**613**	**17**	**194**	**72**	**36**	**13**	**20**	...	**393**	**12**	**50**	**3**
03	**Tonawanda, city**	**222**	**9**	**101**	**25**	**7**	**34**	**19**	**2**	**52**	...	**29**	...
50	Alden	27	...	27	4	1	16	...	...	10	...	8	...
20	*Alden, village*	14	...	11	...	...	10	1	...	6	...	1	...
51	Amherst	70	2	56	3	2	36	5	...	45	...	10	1
21	*Williamsville, village*	18	2	13	...	1	4	2	...	8	...	4	...
52	Aurora	30	...	20	4	...	12	...	...	12	...	2	...
22	*East Aurora, village*	49	3	47	3	...	23	3	1	133	...	2	...
53	Boston	29	...	15	...	...	12	...	...	7	...	...	...
54	Brant	30	1	15	1	2	6	...	...	29	...	...	...
23	*Farnham, village*	15	1	3	...	...	1	...	...	18	...	...	...
55	Cheektowaga	270	11	99	31	8	24	1	...	54	1	11	...
24	*Depew, village* (67)	212	4	52	23	6	4	2	...	...	...	2	...
25	*Sloan, village*	61	3	22	5	4	4	...	...	...	...	1	...
56	Clarence	39	3	33	2	1	21	1	1	119	1	1	...
57	Colden	25	1	23	2	2	10	...	...	35	...	3	...
58	Collins	39	2	25	3	...	17	...	...	4	...	...	...
26*	*Gowanda, village* (0476)	...	...	...	...	...	...	...	...	1	...	...	...
59	Concord	44	2	16	1	...	10	...	...	4	...	1	...
27	*Springville, village*	38	1	39	2	...	29	...	...	8	...	...	...
60	East Hamburg	55	3	40	8	3	24	...	...	15	...	6	...
61	Eden	54	2	35	3	1	21	1	...	73	...	1	...
62	Elma	34	2	23	2	1	14	1	...	19	...	1	...
63	Evans	43	...	22	3	2	10	...	...	13	...	2	...
28	*Angola, village*	41	1	27	5	5	9	1	...	14	1	8	1
64	Grand Island	16	...	10	...	...	9	...	...	3	...	...	...

* See Gowanda, Cattaraugus

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
						Pulmonary, 28-29		Other forms, 30-35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
1	1	....	....	....	....	4	....	....	....	....	....	4	1	1	....	23	55
6	....	....	....	*1*	....	....	*1*	....	....	*1*	....	....	*1*	....	....	*7*	*20*
24	....	....	....	110	2	6	5	....	....	9	1	1	1	3	....	22	56
....	1	....	....	20	....	2	....	....	....	....	1	2	2	1	....	11	57
....	....	1	....	10	....	....	....	....	....	1	....	....	1	....	....	10	58
5	....	1	....	1	....	....	2	....	....	....	1	....	1	1	....	14	59
....	....	....	....	....	....	*1*	....	....	....	....	....	....	....	*1*	....	*9*	*21*
....	....	....	....	9	3	1	1	....	....	....	....	....	....	2	....	11	60
1	....	....	....	*32*	....	....	....	....	....	*2*	....	....	....	....	....	*16*	*22*
10	....	1	1	44	....	3	2	1	....	....	....	3	2	1	....	12	61
6	....	....	....	2	3	....	....	....	....	....	....	2	1	....	....	8	62
....	....	....	....	....	....	*1*	....	....	....	....	....	....	....	....	....	*5*	*23*
22	....	2	....	10	4	3	41	....	....	15	7	7	3	9	1	79	63
5	....	*1*	....	*29*	....	*1*	*1*	....	....	*2*	*1*	*5*	*3*	*8*	1	*27*	*24*
4	....	....	....	164	....	2	....	....	....	4	2	3	1	1	....	13	64
....	....	....	....	*75*	*1*	*1*	....	....	....	*3*	....	*3*	*1*	*1*	....	*7*	*25*
3	....	....	....	*88*	....	....	*2*	....	....	*1*	....	*2*	*2*	*1*	....	*11*	*26*
1	....	2	....	10	....	2	1	....	....	2	2	3	3	5	1	25	65
....	....	*6*	....	*3*	*1*	*1*	*1*	....	....	*4*	*1*	*3*	*4*	*4*	....	*28*	*27*
3	1	....	....	3	....	1	3	....	....	3	2	3	....	2	....	19	66
....	....	....	....	10	....	1	1	....	....	....	2	5	2	....	....	6	67
3	1	4	....	....	....	....	1	....	....	1	2	....	....	1	....	9	68
15	....	1	....	2	....	....	1	....	....	....	....	....	....	....	....	31	69
13	....	....	....	....	....	*4*	....	....	*1*	....	....	*1*	*2*	....	....	*4*	*28*
....	....	....	....	37	....	....	9	....	1	....	....	....	2	4	....	26	10
....	....	....	....	88	8	2	69	....	2	22	20	8	8	7	....	241	11
1830	49	3,644	332	6,190	238	1,015	590	163	78	1228	384	1165	528	584	610	5,666	14
1310	44	3,358	305	4,143	180	869	472	136	62	928	291	897	434	494	464	4,414	01
146	2	77	3	121	10	53	12	16	3	134	18	127	15	4	24	88	02
35	....	9	2	393	5	8	9	1	....	23	4	17	4	7	10	58	03
6	....	1	....	80	1	2	....	....	....	....	....	....	....	....	....	26	50
....	....	....	....	*30*	....	....	*1*	....	....	*1*	....	*1*	....	....	....	10	*20*
30	1	4	....	....	2	1	2	....	....	3	....	....	1	2	....	47	51
15	....	*2*	....	....	*2*	*1*	....	....	....	*3*	....	*1*	....	....	....	*11*	*21*
22	....	12	....	33	....	2	1	....	....	....	1	3	1	2	....	15	52
33	....	*2*	....	*119*	*3*	*2*	*3*	....	....	*2*	....	*10*	*2*	*5*	*1*	*32*	*22*
7	....	1	....	....	....	....	....	....	....	....	1	6	2	2	....	10	53
15	....	1	....	2	....	7	3	1	1	1	....	....	....	1	....	10	54
....	....	....	....	*3*	*1*	....	....	....	....	*1*	....	....	....	....	....	*2*	*23*
31	1	45	8	8	....	5	6	1	1	8	7	2	2	4	12	57	55
4	*1*	*8*	*1*	*7*	*2*	*12*	*5*	....	....	*1*	*1*	*4*	*5*	....	*12*	*25*	*24*
....	....	*6*	*1*	....	....	*2*	*2*	....	....	....	*1*	....	....	....	*2*	*16*	*25*
36	....	7	....	273	....	3	2	....	1	1	1	....	....	4	....	23	56
10	....	1	....	5	1	....	....	....	....	2	3	1	2	3	....	14	57
1	....	4	....	14	....	2	....	....	....	4	1	6	2	3	....	19	58
2	....	*9*	....	*26*	....	*1*	....	....	....	*23*	....	....	....	....	....	....	**26*
19	....	4	....	89	1	1	....	....	....	....	1	6	1	....	....	13	59
9	....	*3*	....	77	*4*	*2*	*1*	....	*2*	*5*	*2*	*5*	....	*2*	....	*28*	27
6	....	....	....	6	1	2	1	....	....	9	1	6	....	2	3	32	60
10	....	....	....	49	1	2	2	....	....	2	....	....	3	2	1	26	61
9	....	....	....	20	....	2	1	....	....	....	....	1	....	1	2	19	62
1	....	4	....	7	....	2	3	1	1	1	....	2	1	....	....	17	63
....	....	*4*	....	*14*	*3*	*3*	*2*	*1*	*1*	....	....	*6*	*2*	....	*2*	*15*	*28*
4	....	....	....	23	....	....	....	....	....	....	....	1	....	2	....	8	64

county for complete total.

Table 17 — New York State (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Deaths, ages at death: Under 1	Deaths, ages at death: 1–4	Deaths, ages at death: 60 and over	Causes, important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	ERIE COUNTY — (*Concluded*)												
65	Hamburg	90	2	43	8	2	16	...	...	13	...	3	...
29	*Blasdell, village*	*42*	...	*15*	*3*	*2*	*7*	...	...	*3*	...	*1*	...
30	*Hamburg, village*	*49*	*1*	*48*	...	*3*	*31*	*1*	...	*17*	...	*7*	...
66	Holland	18	...	15	4	1	7	3	...	20	...	...	...
67	Lancaster (24)	47	3	31	6	2	13	...	...	17	...	2	...
31	*Lancaster, village*	*145*	*3*	*68*	*18*	*4*	*17*	*1*	...	*19*	...	*17*	*2*
68	Marilla	18	...	14	...	1	10	...	...	10	...	...	...
69	Newstead	42	1	27	2	2	18	...	...	120	1	...	...
32	*Akron, village*	*32*	*2*	*25*	...	...	*19*	...	...	*147*	...	*4*	...
70	North Collins	22	...	12	3	1	8	...	...	2	...	...	...
34	*North Collins, village*	*24*	...	*19*	*2*	...	*14*	...	...	...	...	...	...
71	Sardinia	32	...	17	2	1	8	...	...	11	...	4	...
72	Tonawanda	45	3	29	6	...	8	2	...	19	...	1	...
33	*Kenmore, village*	*26*	*1*	*22*	...	...	*16*	...	*1*	*112*	...	...	...
73	Wales	22	1	11	1	...	8	...	...	...	...	...	...
74	West Seneca	139	5	92	5	3	52	3	1	164	...	5	...
10	Buffalo State Hospital	...	...	226	...	...	94	...	...	1	...	...	...
11	Gowanda State Hospital	...	...	70	...	...	37	1	...	...	...	...	...
	Thomas Indian School	...	...	...	...	...	...	...	...	...	...	...	...
12	Our Lady of Victory Infant Home, Lackawanna	259	8	199	166	18	1	...	1	64	12	...	...
15	ESSEX COUNTY	745	27	545	73	16	219	9	1	293	5	75	2
50	Chesterfield	16	...	14	2	...	9	...	...	...	...	...	...
*20**	*Keeseville, village (0951)*	*12*	...	*14*	*3*	...	*9*	...	...	...	...	...	...
51	Crown Point	25	2	25	...	...	15	1	...	8	...	1	...
52	Elizabethtown	12	...	14	1	1	5	...	...	2	2	...	...
21	*Elizabethtown, village*	*2*	...	*6*	*1*	...	*4*	...	...	*2*	...	...	...
53	Essex	27	1	17	1	2	8	...	...	30	1	4	1
54	Jay	53	1	26	4	1	18	3	...	54	...	...	...
55	Keene	26	1	28	2	1	10	...	...	...	...	...	...
56	Lewis	17	...	11	2	...	4	...	...	...	...	...	...
57	Minerva	9	...	7	1	...	4	...	...	...	...	2	...
58	Moriah	132	3	61	18	1	16	...	...	38	1	7	...
22	*Port Henry, village*	*62*	*2*	*25*	*4*	*1*	*8*	...	...	*100*	*1*	*8*	...
59	Newcomb	4	...	2	1	...	1	...	...	1	...	...	...
60	North Elba	14	2	14	1	1	4	...	1	...	...	...	...
23	*Lake Placid, village*	*50*	*3*	*26*	*2*	*1*	*11*	*1*	...	*14*	...	*18*	...
24	*Saranac Lake, village*	*48*	*3*	*69*	*6*	*2*	*6*	...	...	*4*	...	*20*	*1*
[*24*†	*Saranac Lake, village (62, 1663)*	*106*	*5*	*291*	*15*	*2*	*25*	...	...	*55*	*1*	*34*	*1*
61	North Hudson	8	...	4	2	...	1	...	...	3	...	...	...
62	St. Armand	2	...	6	1	...	1	...	...	...	...	1	...
25	*Bloomingdale, village*	*5*	...	*5*	*1*	...	*1*	...	...	...	...	...	...
63	Schroon	17	...	16	1	...	8	1	...	...	...	12	...
64	Ticonderoga	82	4	62	6	2	32	...	...	...	...	...	...
27	*Ticonderoga, village*	*53*	*1*	*28*	*4*	...	*18*	*2*	...	...	...	...	...
65	Westport	10	1	12	...	1	4	1	...	5	...	...	...
28	*Westport, village*	*10*	*1*	*18*	*3*	*1*	*12*	...	...	*19*	...	*1*	...
66	Willsboro	38	...	16	3	1	8	...	...	13	...	1	...
67	Wilmington	11	2	7	3	...	2	...	...	...	...	...	...
10	Raybrook Hospital for Incipient Tuberculosis	...	...	12	...	...	...	...	...	...	...	...	...

* See Keeseville, Clinton county, for complete total. † Saranac Lake, village, located in two counties, Essex

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
						Pulmonary, 28-29		Other forms, 30-35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
		4	1	7	2	4	2			2	2	3	3	3	2	28	65
		2		15	1					3		3	2	1	1	10	29
4		2		1		1	1	2	2	1	3		3	4		35	30
1		1		16								3		2	1	12	66
9		4	2	60	1	4	2			1	1	2	2	5	2	16	67
26		5		124	1	4	5	1		7	2	8	2	1	8	37	31
5		8	2	1						2	2			1		9	68
		2		59	3	2	1			1		4		2	2	18	69
		3		33	3	1	2			3		2		3		17	32
		1				1					2			1		9	70
													1	3	1	14	34
4				15			1			7	2	3	1	2		11	71
		4		2	3	6	2	1		3	1	2	1		3	19	72
2		4		70		4				4	1	4	2	1		17	33
		1			1											10	73
5		13	1	186	5	4	5	2		17	1	5	3	7	3	66	74
		20	2	57	1		33		2	6	19	8	9	5		155	10
		1		1			7			5	4	7	10	3		46	11
13				1						1							
		7	4				1		2	13	11	9	12		54	102	12
18		39		340	37	102	95	6	7	39	18	28	23	30	16	311	15
							1						2	1		10	50
						1									1	13	*20
					1			1	2	1	1			3		18	51
		2		34	2	5	1			4	1	1		2		6	52
				61	1	2				2		1				5	21
					3	1	2									10	53
		7				4	2				2	1	1	2		19	54
1		2		37	13	1	3			5			1	1		10	55
						1	2							1		8	56
					1	1							1			5	57
		4		103	6	3	3	1	1	8	4	10	6	1	2	37	58
		3		51	4	5	1			14		2	1	2	2	14	22
						1						2				2	59
						2	3	1			1	1	4			5	60
11		2			1	27	1	2	2	2	1	6		1	1	19	23
				2		22	50							2	1	15	24
		1		63	2	320	233	66		12	1	7	4	10	2	37	†24]
				17						2	1			1		2	61
				1		6	3	1						1	1	1	62
				25		5	2		1			1			1	1	25
4				1		3	3			1	1		1	2		9	63
		9				3	4		1		1	2	4	4	3	45	64
		9			2	2	2				1			2	1	20	27
						2					3			1		8	65
					2	2					1		1	1		13	28
2		1		8		3						1		2	2	12	66
					1								1		1	4	67
							12										10

and Franklin. Total for entire village given in bracketed line

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS		DEATHS				CAUSE					
				AGES AT DEATH				IMPORTANT					
								Typhoid fever, 1		Measles, 6		Scarlet fever, 7	
		Living births	Stillbirths	Total deaths at all ages	Under 1	1–4	60 and over	Cases	Deaths	Cases	Deaths	Cases	Deaths
16	FRANKLIN COUNTY	1,096	42	867	127	43	264	19	3	70	1	112	3
50	Altamont	69	3	47	7	5	7	2	3				
20	*Tupper Lake, village*	*78*	*3*	*36*	*12*	*1*	*4*						
51	Bangor	49	2	21	1	4	12	1				7	
25	*North Bangor, village*	*1*											
52	Belmont	35		15	8	2	4						
53	Bombay	58	2	41	6	4	15						
54	Brandon	16		8	1		4					2	
55	Brighton	17		15			3						
56	Burke	41	1	29	5	1	16	1				12	
57	Chateaugay	56	1	28	8	1	9					8	
21	*Chateaugay, village*	*38*		*21*	*5*		*7*					*3*	
58	Constable	22		14	1	1	10					9	
59	Dickinson	37	1	18	5	1	5			1			
60	Duane	8		4		1						2	2
61	Fort Covington	31		12	2	1	7	3				1	
22	*Fort Covington, village*	*20*		*17*	*2*		*7*						
62	Franklin	33	3	18	6	2	8	1		4			
63	Harrietstown	9	1	10			5			9			
23§	*Saranac Lake, village (1560, 1562)*	*58*	*2*	*222*	*9*		*17*			*51*	*1*	*14*	
64	Malone	55	2	64	11	7	27	2		1			
24	*Malone, village*	*213*	*11*	*154*	*29*	*7*	*62*	*2*		*3*		*14*	*1*
65	Moira	53	4	39	7	2	18	1		1		1	
66	Santa Clara	14		2			1					2	
67	Waverly	52	3	20	4	2	10					36	
68	Westville	33	3	12	3	1	6	6				1	
17	FULTON COUNTY	846	26	751	72	21	392	12	3	113		38	1
01	**Gloversville, city**	443	16	397	39	10	190	8	2	41		8	
02	**Johnstown, city**	184	3	141	16	5	84	1		37		28	1
50	Bleecker	5		3			2						
51	Broadalbin	45	3	37	3	2	18	1	1				
52	Caroga	4		5			2						
53	Ephratah	17	1	25		2	17	2					
54	Johnstown	42	1	42	3		28			1		1	
55	Mayfield	23	1	23	1	1	11						
20	*Mayfield, village*	*8*		*4*		*1*							
56	Northampton	24	1	16	3		8			10			
21	*Northville, village*	*14*		*23*	*3*		*12*			*23*			
57	Oppenheim	18		11			7					1	
(22)	*Dolgeville, village*	*6*		*4*	*2*								
*[22**	*Dolgeville, village (2158)*	*54*	*1*	*31*	*3*	*1*	*14*			*137*	*1*	*18*	
58	Perth	9		9	1		7			1			
59	Stratford	4		11	1		6						
18	GENESEE COUNTY	778	23	559	50	27	306	22	2	636	4	106	15
01	**Batavia, city**	348	16	247	33	18	106	7	1	295	4	48	3
50	Alabama	36	1	17		1	12			102		23	1
51	Alexander	10		15	1		10			5			
20	*Alexander, village*	*1*		*3*			*3*						
52	Batavia	31	1	21	1		12			12		3	
53	Bergen	15		4			4			5		2	
21	*Bergen, village*	*6*		*8*			*8*			*33*		*3*	
54	Bethany	23	2	20			16	1	1	1		1	
55	Byron	18		28	1	1	21			26			

* Dolgeville, village, located in two counties, Fulton and Herkimer. Total for entire

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
						Pulmonary, 28-29		Other forms, 30-35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
68	6	45	6	242	29	1,333	219	70	10	64	26	63	48	41	40	435	16
....	....	....	....	13	5	1	....	....	....	....	1	16	7	....	1	30	50
....	....	....	....	8	3	....	3	....	....	5	1	10	4	1	1	23	20
1	....	1	1	....	....	1	....	....	....	....	....	....	....	2	1	17	51
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	25
2	1	12	....	....	3	1	....	....	....	....	1	....	....	....	1	9	52
....	....	5	....	....	3	....	4	....	1	....	....	....	4	3	3	23	53
....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	6	54
1	....	....	....	81	....	1	8	....	....	....	....	....	....	1	....	6	55
....	....	....	....	....	1	2	....	....	1	6	5	....	2	....	2	18	56
4	1	....	....	2	1	1	....	....	....	9	2	5	1	1	3	19	57
5	....	2	....	....	1	1	2	....	....	8	2	2	....	2	....	14	21
....	....	1	....	....	1	1	....	....	....	....	2	....	....	1	....	10	58
9	....	1	....	5	....	1	1	....	1	2	1	9	3	1	....	11	59
....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	2	60
....	....	....	....	....	....	1	1	....	....	....	....	....	....	1	1	9	61
....	....	1	1	....	1	2	2	....	....	....	....	....	2	1	1	9	22
1	1	1	....	24	....	3	2	....	....	5	1	6	1	....	4	9	62
....	....	2	....	....	....	7	3	2	....	1	....	....	....	....	....	7	63
....	....	1	....	61	2	1,298	183	66	....	12	1	7	4	8	1	22	23
2	....	7	1	....	2	3	....	....	3	....	4	....	4	4	4	42	64
....	2	7	3	....	4	4	9	....	1	....	4	....	11	6	8	105	24
9	1	3	....	....	1	3	1	....	2	10	....	5	3	4	5	22	65
....	....	1	....	12	....	....	....	....	....	....	....	1	....	....	....	2	66
34	....	....	....	36	....	2	....	1	....	5	1	2	....	3	3	13	67
....	....	....	....	....	1	....	....	....	....	....	....	....	2	1	1	7	68
39	4	8	2	207	56	41	29	3	7	70	13	63	39	58	13	526	17
19	1	4	2	2	33	21	13	1	3	53	7	35	18	35	7	276	01
10	....	2	....	56	7	5	4	1	2	8	3	17	9	9	3	103	02
....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	2	50
1	2	1	....	51	8	6	3	....	....	3	....	1	....	3	....	20	51
....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	2	52
....	....	....	....	....	....	....	....	1	....	....	2	....	1	....	....	22	53
....	....	....	....	....	1	....	3	....	1	....	....	....	1	3	1	32	54
....	....	....	....	13	5	....	....	....	1	2	....	1	1	2	....	14	55
....	....	....	....	....	1	1	1	....	....	1	....	....	....	....	....	2	20
5	....	....	....	16	....	1	....	....	....	....	....	....	....	1	....	15	56
....	1	1	....	46	....	3	2	....	....	1	....	1	1	3	1	15	21
....	....	....	....	21	....	2	1	....	....	1	....	3	3	....	....	7	57
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	(22)
....	....	1	....	86	2	2	1	....	....	17	1	7	2	2	....	22	*22]
4	....	....	....	1	1	....	....	....	....	....	....	1	....	....	1	7	58
....	....	....	....	1	....	1	2	....	....	1	1	3	3	....	....	5	59
101	1	49	3	324	31	40	15	4	7	64	18	32	20	24	6	423	18
60	....	17	1	177	21	24	4	2	2	34	7	16	9	12	4	179	01
7	....	3	....	25	....	....	1	....	1	3	1	1	....	1	....	12	50
....	....	....	....	6	....	....	1	....	1	5	1	....	....	....	....	12	51
....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	3	20
6	....	2	1	4	1	1	1	....	....	2	....	3	1	2	....	15	52
....	....	....	....	4	....	1	....	....	....	....	....	....	....	1	....	3	53
....	....	....	....	1	....	....	....	....	....	....	1	1	....	....	....	7	21
....	....	....	....	....	2	....	....	....	....	....	....	2	....	....	....	17	54
....	1	2	....	6	....	1	1	....	....	5	....	1	....	....	....	26	55

village given in bracketed line. § See Saranac Lake, Essex county, for complete total.

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Birth: Living births	Birth: Stillbirths	Deaths: Total deaths at all ages	Deaths, ages at death: Under 1	Deaths, ages at death: 1–4	Deaths, ages at death: 60 and over	Cause, important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	GENESEE Co. — (*Concluded*)												
56	Darien	33	1	26	2	....	12	1	....	26	....	3	....
57	Elba	18	.....	12	....	....	9	....	....	5	....	1	....
22	*Elba, village*	*7*	.....	*3*	*1*	....	*1*	....	....	*1*	....	....	....
58	Leroy	23	.....	16	1	....	7	1	....	5	....	....	....
23	*Leroy, village*	*75*	.....	*50*	*2*	*1*	*35*	*5*	....	*8*	....	*2*	....
59	Oakfield	19	.....	13	1	....	10	....	....	11	....	6	....
24	*Oakfield, village*	*29*	.....	*14*	*3*	*1*	*6*	....	....	*23*	....	*3*	*1*
60	Pavilion	23	1	17	....	2	13	....	....	....	....	....	....
61	Pembroke	38	.....	23	3	2	12	....	....	32	....	4	....
25	*Corfu, village*	*2*	*1*	*9*	....	*1*	*4*	*7*	....	*10*	....	....	....
62	Stafford	23	.....	13	1	....	7	....	....	....	....	7	....
	State School for the Blind	....	....	....	....	....	....	....	....	36	....	....	....
19	GREENE COUNTY	436	13	450	34	11	259	25	1	383	3	27	2
50	Ashland	15	1	5	....	....	2	....	....	7	....	....	....
51	Athens	9	1	10	1	....	5	....	....	6	....	....	....
20	*Athens, village*	*31*	*2*	*26*	*3*	*1*	*12*	....	....	*3*	....	....	....
52	Cairo	19	.....	46	1	....	32	5	....	26	....	2	....
53	Catskill	49	3	43	6	1	18	....	....	36	....	3	....
21	*Catskill, village*	*82*	*3*	87	*10*	*2*	*46*	*12*	*1*	*76*	....	*6*	*1*
54	Coxsackie	15	.....	22	1	....	16	2	....	20	....	....	....
22	*Coxsackie, village*	*28*	.....	*37*	*3*	*3*	*25*	....	....	*125*	*3*	*11*	*1*
55	Durham	19	.....	19	2	....	10	....	....	17	....	2	....
56	Greenville	25	1	33	3	....	21	2	....	10	....	1	....
57	Halcott	10	.....	5	1	....	2	....	....	1	....	....	....
58	Hunter	25	.....	29	....	1	15	....	....	....	....	....	....
23	*Hunter, village*	*3*	.....	*4*	....	....	*3*	....	....	....	....	....	....
24	*Tannersville, village*	*9*	.....	*7*	....	....	*4*	....	....	....	....	....	....
59	Jewett	16	.....	10	1	....	7	....	....	....	....	....	....
60	Lexington	28	1	16	....	2	4	3	....	16	....	....	....
61	New Baltimore	14	.....	24	....	....	21	1	....	15	....	1	....
62	Prattsville	14	.....	8	....	....	6	....	....	24	....	....	....
63	Windham	25	1	19	2	1	12	....	....	1	....	1	....
20	HAMILTON COUNTY	79	3	49	5	1	23	1	....	4	....	....	....
50	Arietta	2	.....	4	....	....	2	....	....	....	....	....	....
51	Benson	1	.....	2	....	....	1	....	....	....	....	....	....
52	Hope	1	.....	3	....	....	2	....	....	3	....	....	....
53	Indian Lake	33	1	8	3	....	4	....	....	....	....	....	....
54	Inlet	0	.....	4	....	....	2	....	....	....	....	....	....
55	Lake Pleasant	9	.....	6	....	....	3	....	....	....	....	....	....
56	Long Lake	23	1	12	2	1	2	....	....	1	....	....	....
57	Morehouse	1	.....	....	....	....	....	....	....	....	....	....	....
58	Wells	9	1	10	....	....	7	1	....	....	....	....	....
21	HERKIMER COUNTY	1,436	44	860	116	35	402	22	4	1,367	4	129	2
01	**Little Falls, city**	352	9	170	30	11	62	1	....	696	2	45	....
50	Columbia	18	.....	16	....	....	13	....	....	5	....	....	....
51	Danube	10	1	15	1	....	6	....	....	10	....	....	....
52	Fairfield	14	.....	12	2	2	5	1	1	13	....	6	....
20	*Middleville, village (59)*	*16*	*1*	*8*	*2*	....	*4*	....	....	*53*	....	*2*	....
53	Frankfort	56	1	24	7	....	11	1	....	11	....	2	....
21	*Frankfort, village*	*136*	*2*	*54*	*14*	*4*	*23*	*2*	....	*8*	....	....	....
54	German Flats	10	2	18	4	....	8	1	....	13	....	....	....

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement from each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35: Pulmonary, 28-29		Tuberculosis: Other forms, 30-35		Pneumonia, 91-92: Broncho, 91		Pneumonia: Lobar and unqualified, 92		Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
1		3		86	1	2	2		1	3	2		1	1	1	17	56
1				1	2									2		8	57
				2												*3*	*22*
		6		5	1	1	1					2	1	1		12	58
6		*8*	*1*	*4*	*1*	*7*	*2*			*9*	*3*	*5*	*4*	*4*		*35*	*23*
17		3					1									12	59
2		*2*				*2*				*1*	*1*		*1*			*11*	*24*
							1	1			1		1			14	60
1					1				2		1		1			18	61
		3											*1*			*8*	*25*
				3	1	1				*2*		1			1	11	62
83	3	34	2	390	8	63	39	2	2	29	10	21	18	47	3	312	19
						1								2		3	50
				3		2	2					1		1		7	51
	1	*1*		*4*	*2*	*1*	*2*		*1*		*1*	*1*	*1*	*7*	*1*	*10*	*20*
10		5		78	1	14	5	1		3		2	1	3		36	52
1		4		27	1	3	3	1		3		6	2	4		33	53
17	*1*	*19*			*1*	*15*	*4*		*1*	*2*	*3*	*2*	*5*	*8*	*1*	*61*	*21*
				42	1	4	4					3	1			16	54
19				*129*			*1*			*12*	*3*		*1*	*4*		*24*	*22*
3					2	3	3				1			1		12	55
10			1			7	4							6		22	56
											1			1		3	57
		3	1			2	4						2	2	1	19	58
						1	*1*									*3*	*23*
							1									*6*	*24*
														3		7	59
8				59		1	1			1			1	1		13	60
		2		17			1			7	1	5	1	4		17	61
				27		1						1	3			5	62
15	1			4		8	3			1						15	63
		1		96	1	2	6			4	5	27	3	4		30	20
							1									3	50
				5		1	1							1			51
						1	1									2	52
										1	3					5	53
		1														4	54
							2				1					3	55
				91	1					3	1	27	2	1		7	56
																	57
							1						1	2		6	58
243	6	55	5	1,054	29	128	46	14	6	71	33	116	40	69	31	585	21
148	2	21	1	417	5	24	3	3		15	2	52	9	14	11	121	01
													2	1		13	50
1				11								1		3		12	51
				1	1	1	1	1	1		1	1		1		6	52
				16											*2*	*6*	*20*
		4		7	2	4					1	1	1	1	2	17	53
2		*8*	*1*	*39*	*2*	*14*	*3*			*4*	*2*	*8*	*1*	*4*	*5*	*36*	*21*
				8		3	3			2	2	3		3	2	8	54

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS		DEATHS	AGES AT DEATH			CAUSE: IMPORTANT					
								Typhoid fever, 1		Measles, 6		Scarlet fever, 7	
		Living births	Stillbirths	Total deaths at all ages	Under 1	1–4	60 and over	Cases	Deaths	Cases	Deaths	Cases	Deaths
	HERKIMER CO. — (*Concluded*)												
22	*Ilion, village*	*187*	*5*	*127*	*13*	*3*	*66*	*6*	*1*	*97*	....	*4*	....
23	*Mohawk, village*	*53*	*3*	*41*	*6*	....	*23*	....	....	*10*	....	*13*	*1*
55	Herkimer	31	1	47	1	....	32	1	....	14	....	....	....
24	*Herkimer, village*	*278*	*12*	*137*	*24*	*10*	*54*	*2*	*1*	*241*	*1*	*25*	*1*
56	Litchfield	11	....	8	....	....	5	....	....	1	....	....	....
57	Little Falls	13	....	10	1	1	4	....	....	31	....	2	....
58	Manheim	8	....	8	....	....	6	1	....	4	....	....	....
(*25*)	*Dolgeville (1757)**	*48*	*1*	*27*	*1*	*1*	*14*	....	....	*137*	*1*	*18*	....
59	Newport (20)	18	....	3	1	....	1	....	....	2	....	....	....
26	*Newport, village*	*12*	*1*	*10*	....	....	*8*	....	....	....	....	....	....
27	*Poland, village (62)*	*3*	*1*	*12*	....	....	*5*	....	....	....	....	*1*	....
60	Norway	10	1	6	....	1	2	....	....	2	....	4	....
61	Ohio	9	....	8	1	....	3	....	....	....	....	....	....
62	Russia (27)	23	....	9	2	....	2	5	....	5	....	....	....
28	*Cold Brook, village*	*4*	....	*6*	....	....	*3*	....	....	....	....	....	....
63	Salisbury	30	2	17	....	....	10	1	....	....	....	....	....
64	Schuyler	17	1	11	1	1	4	....	....	1	....	....	....
65	Stark	12	....	8	1	....	3	....	....	9	....	....	....
66	Warren	14	....	13	1	....	10	....	....	3	....	....	....
67	Webb	13	....	5	1	....	1	....	....	....	....	....	....
29	*Old Forge, village*	*7*	....	*10*	....	....	*1*	....	*1*	*1*	....	*7*	....
68	Wilmurt	....	....	....	....	....	....	....	....	....	....	....	....
69	Winfield	14	....	11	1	1	6	....	....	....	....	....	....
30	*West Winfield, village*	*9*	....	*9*	*1*	....	*7*	....	....	....	....	....	....
22	JEFFERSON COUNTY	1,722	77	1,355	161	41	689	42	8	84	2	285	13
01	**Watertown, city**	787	44	616	88	18	252	15	6	44	1	124	8
50	Adams	36	....	22	3	....	12	....	....	1	....	2	....
20	*Adams, village*	*13*	*2*	*27*	*1*	*1*	*18*	....	....	*2*	....	....	....
51	Alexandria	44	....	24	2	....	16	2	....	....	....	10	....
21	*Alexandria Bay, village*	*38*	....	*19*	*2*	*2*	*8*	*1*	....	*4*	....	*2*	*1*
52	Antwerp	29	2	22	3	1	10	3	....	....	....	14	....
22	*Antwerp, village*	*13*	*2*	*22*	*2*	....	*14*	*1*	*1*	*1*	....	*5*	....
53	Brownville	18	1	19	....	....	13	....	....	2	....	....	....
23	*Brownville, village*	*14*	....	*19*	*2*	*1*	*12*	....	....	....	....	*3*	....
24	*Dexter, village*	*27*	*2*	*12*	*1*	....	*7*	....	....	....	....	....	....
25	*Glen Park, village*	*11*	....	*2*	....	....	*2*	*3*	....	....	....	*2*	....
54	Cape Vincent	18	....	11	....	....	7	....	....	....	....	16	....
26	*Cape Vincent, village*	*17*	*2*	*17*	....	....	*9*	*2*	*1*	*1*	....	....	....
55	Champion	29	2	19	2	....	12	....	....	1	....	5	1
27	*West Carthage, village*	*31*	*2*	*27*	*2*	*1*	*19*	....	....	*1*	....	*20*	....
56	Clayton	34	1	16	3	....	11	1	....	13	....	6	....
28	*Clayton, village*	*24*	*1*	*16*	*1*	*1*	*12*	....	....	....	....	*3*	....
57	Ellisburg	44	1	44	3	....	28	....	....	1	....	4	....
29	*Belleville, village*	*4*	....	*9*	....	....	*5*	....	....	....	....	....	*1*
30	*Ellisburg, village*	*3*	....	*5*	....	....	*5*	....	....	....	....	*2*	....
31	*Mannsville, village*	*1*	*1*	*4*	....	....	*5*	....	....	....	....	....	....
58	Henderson	10	1	8	....	....	4	....	....	....	....	....	....
32	*Henderson, village*	*7*	....	*8*	....	....	*5*	....	....	....	....	....	....
59	Hounsfield	18	....	19	1	2	13	....	....	....	....	3	....
33	*Sacketts Harbor, village*	*13*	*1*	*23*	*2*	*1*	*12*	....	....	....	....	*3*	....
60	Le Ray	24	1	33	4	1	18	....	....	....	....	5	....
34	*Black River, village (67)*	*13*	....	*17*	*2*	....	*9*	....	....	....	....	*1*	....
61	Lorraine	17	1	11	2	1	5	....	....	1	....	....	....
62	Lyme	19	1	13	2	....	8	....	....	....	....	....	....
35	*Chaumont, village*	*13*	....	*10*	*1*	....	*7*	....	....	*2*	*1*	....	....
63	Orleans	38	2	15	2	....	10	....	....	....	....	12	....

* See Dolgeville, Fulton county

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

Reportable diseases: Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35: Pulmonary, 28-29		Tuberculosis, 28-35: Other forms, 30-35		Pneumonia, 91-92: Broncho, 91		Pneumonia, 91-92: Lobar and unqualified, 92		Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
		8		346	8	27	8	5		2	2	16	7	12	5	84	22
4	1	2		20		4	1			8	5	1	1	1		31	23
			1			2	1		1	2		1	1	8		35	55
77	2	3		79	5	20	6	1	3	17	14	13	10	9	2	83	24
					1			1					1	3		3	56
				8		2	1					4	2	2		5	57
		2				1	1					1	1			6	58
		1		86	2	2	1			17	1	7	2	2		18	25
						1	1					2				2	59
3				4		2						3				10	26
						2		1	1				1			10	27
																6	60
					1		1						1		1	4	61
			1			1	1			1					1	6	62
																6	28
		1			1	3	3			3	1	1				12	63
2		1	1	11		2	3				1			1		5	64
5	1	2				1								1		6	65
1		1										1		2		11	66
						3	1									4	67
		1				9	7	2								2	29
																	68
					1									1		9	69
				1							1					8	30
478	11	74	8	1,132	56	85	50	6	11	103	45	102	55	118	26	952	22
264	6	37	5	779	25	45	30	4	7	65	20	69	30	57	12	409	01
19		5		5		1	1			2		5	2	1	1	17	50
				5			1					1	3	2		21	20
												1	1	1		22	51
1				1	1	2	1				1	1		2		13	21
	1	2	1			4							1	3		16	52
						1	2						1			18	22
8				26	1							1	2	2		14	53
9	2				2									1		14	23
12		1		40	3					3	1	1		1		7	24
						1										2	25
1					1	1							1	2		7	54
		1			1		1						1			13	26
		1			1	1	1			2	1			3		12	55
		10			1	1	1			1	1			2	1	21	27
10		1				2						2	1	2		13	56
7										1		1		2	2	12	28
1		6	1	10	3	3	2		1	1	1		3	6		27	57
							1									7	29
2				3	1	3								1		3	30
						1					1					3	31
6				27		1						2	1			7	58
				1										1		7	32
30	1			53	1					1	2	3		1		14	59
8		1		102	1						1	5	2	2		17	33
1	1			31		2	1			4	3	2	1	1	1	25	60
4						1	1					1		3		13	34
27										2	1		2	1	1	6	61
														2		11	62
																9	33
4		1		2	2	2						1				13	65

for complete total.

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births		Deaths				Causes					
				Ages at death				Important					
								Typhoid fever, 1		Measles, 6		Scarlet fever, 7	
		Living births	Stillbirths	Total deaths at all ages	Under 1	1–4	60 and over	Cases	Deaths	Cases	Deaths	Cases	Deaths
	JEFFERSON Co. — (*Concluded*)												
64	Pamelia	6	1	33	3		25					1	
65	Philadelphia	20	1	11	2	1	3					1	
36	*Philadelphia, village*	14		16		2	13			1			
66	Rodman	19		16			12					3	
67	Rutland (34)	24	1	12			9			1		6	
68	Theresa	15		9	2		6						
37	*Theresa, village*	24		14			10	4		3			
69	Watertown	13		5			4						
70	Wilna	68		48	8	3	16	3		1		12	
38	*Carthage, village*	105	4	58	15	5	25	7		1		20	2
71	Worth	7		4			3			3			
24	LEWIS COUNTY	489	21	340	36	4	205	2		24		19	
50	Croghan	44	4	27	3		14						
20	*Croghan, village (62)*	20		10	1		6					2	
51	Denmark	28	3	18	3		10					4	
21	*Copenhagen, village*	4		18	1		14						
52	Diana	29	3	16	3		9			8			
22	*Harrisville, village*	25		9	2	1	4			6		1	
53	Greig	15	1	8	1		4			1			
54	Harrisburg	13		4	2							1	
55	High Market	6		7			3						
56	Lewis	21	1	4			3			3			
57	Leyden	21		11	2		5						
23	*Port Leyden, village (59)*	8		12	1		8						
58	Lowville	13		20	1		13			1		2	
24	*Lowville, village*	43	2	52	5		36	1				1	
59	Lyonsdale (23)	16		9			6						
25	*Lyons Falls, village (67)*	16	1	10	2		5			1		2	
60	Martinsburg	43	1	23	4	1	14			1			
61	Montague	17		6			4						
62	New Bremen (20)	31	1	16	1		13			1		1	
63	Osceola	13	3	8	2		3	1					
64	Pinckney	12		10			6					5	
65	Turin	17		6	1	1	3			2			
26	*Turin, village*	3		7		1	4						
66	Watson	4	1	11	1		8						
67	West Turin (25)	21		10			7						
27	*Constableville, village*	6		8			5						
25	LIVINGSTON COUNTY	686	28	597	45	16	277	15	3	430	3	32	1
50	Avon	17		12	1		8			21		2	
20	*Avon, village*	54	2	27	3	1	12			27	1	5	
51	Caledonia	12		9	1		4	1	1	13		2	
21	*Caledonia, village*	14	1	19			16	10		15			
52	Conesus	14	1	11			6		1	23			
53	Geneseo	22	1	13			10			14			
22	*Geneseo, village*	38		44	6	1	27			99	1		
54	Groveland	26		10			3			2		1	
55	Leicester	37	4	15	3	2	2			23		2	
23	*Leicester, village*	7		6	1		5			5			
56	Lima	19		17	3	1	8			10			
24	*Lima, village*	8	1	17	3		8			34			
57	Livonia	29		18	2		12			36		1	
25	*Livonia, village*	8		16			10			23		4	
58	Mt. Morris	25	1	10	1	1	7			2			1
26	*Mt. Morris, village*	92	7	44	5	6	13	4	1	1		4	
59	North Dansville			2			1						

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES										Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All Other causes	District number
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Broncho, 91		Lobar and unqualified, 92					
						Pulmonary, 28-29		Other forms, 30-35									
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
5	...	...	...	...	...	1	...	...	...	...	1	...	...	4	...	28	64
...	...	...	...	...	...	...	2	2	...	1	...	1	1	2	...	6	65
...	...	...	...	...	...	1	...	...	1	1	2	1	1	1	...	11	36
1	...	...	...	43	...	1	...	...	1	...	...	1	1	2	...	12	66
...	...	3	1	...	1	1	1	...	...	...	1	...	...	1	...	7	67
...	...	...	...	...	2	1	...	...	...	...	...	...	...	1	...	6	68
1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	13	37
...	...	...	...	4	...	2	1	...	...	...	...	...	...	1	...	3	69
9	...	2	...	...	2	...	...	...	...	13	7	...	...	7	4	28	70
40	...	3	...	...	6	6	3	...	1	6	1	2	...	...	4	41	38
8	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	4	71
24	2	4	1	506	17	25	8	...	2	30	9	41	21	29	5	246	24
7	2	...	...	44	...	1	...	...	...	1	...	5	1	4	...	20	50
...	...	...	...	52	...	2	...	...	...	5	...	7	1	...	...	9	20
...	...	...	...	2	...	3	...	...	...	...	1	...	1	...	...	16	51
...	...	...	...	...	...	...	...	...	1	...	...	...	2	2	...	13	21
...	...	3	1	...	...	2	...	...	...	3	...	3	2	...	2	11	52
6	...	...	...	...	...	1	1	...	...	1	1	3	2	2	...	3	22
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	53
...	...	...	...	26	1	...	...	...	...	...	...	2	...	...	...	8	54
...	...	...	...	18	1	...	1	...	...	...	...	...	...	...	...	5	55
...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	4	56
...	...	...	...	13	1	2	2	...	...	...	...	...	...	...	1	7	57
...	...	...	...	44	1	1	...	...	...	1	...	5	2	...	...	9	23
...	...	...	...	7	...	...	1	...	...	1	1	...	2	...	...	16	58
3	...	1	...	121	3	8	1	...	...	5	1	3	2	5	...	40	24
...	...	...	...	13	...	...	...	...	...	...	...	...	1	1	...	7	59
3	...	...	...	...	...	...	1	...	...	...	...	1	1	...	...	8	25
...	...	...	...	15	1	2	1	...	...	5	2	1	...	3	...	16	60
...	...	...	...	4	...	1	...	...	...	1	1	...	2	...	...	8	61
1	...	...	...	40	...	...	...	...	...	5	...	7	2	4	...	10	62
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	63
...	...	...	...	32	2	1	...	...	...	...	...	...	...	2	...	6	64
...	...	...	...	5	...	...	...	...	1	...	...	3	...	...	1	4	65
...	...	...	...	...	1	...	...	...	...	...	1	...	...	1	1	3	26
...	...	...	...	1	2	...	...	...	...	...	1	...	...	1	...	7	66
4	...	...	...	28	2	1	...	...	...	...	...	1	...	2	...	6	67
...	...	...	...	36	2	...	...	...	...	2	...	...	...	2	...	4	27
127	1	52	4	361	20	24	39	3	3	53	35	43	34	40	7	407	25
2	...	...	...	6	...	...	...	...	...	...	...	...	...	3	...	9	50
10	...	...	...	14	1	4	3	...	...	2	2	3	1	3	2	14	20
1	...	...	...	35	...	...	1	...	...	1	...	4	1	...	...	6	51
2	...	1	...	55	...	...	...	...	...	1	...	...	...	2	...	17	21
2	...	...	...	15	2	1	2	...	...	2	...	...	1	...	...	5	52
9	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	10	53
17	...	6	...	...	1	2	1	...	...	1	1	1	...	4	...	36	22
...	...	10	...	1	...	...	1	...	...	9	...	4	2	...	...	7	54
...	...	1	...	...	1	1	1	1	...	2	1	1	...	...	2	10	55
...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	5	23
8	...	1	...	28	...	...	...	...	...	1	1	2	1	...	...	15	56
10	...	...	...	74	1	2	2	...	1	3	...	3	1	...	1	11	24
4	...	...	...	4	2	2	...	...	...	1	...	...	1	2	...	13	57
8	...	...	...	4	1	1	1	...	...	2	1	3	...	3	...	10	25
...	...	1	...	...	...	...	...	...	...	...	1	2	2	2	...	4	58
1	...	6	2	...	3	5	2	1	...	10	4	7	3	1	2	26	26
...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	59

Table 17 — New York State (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Deaths, ages at death: Under 1	Deaths, ages at death: 1–4	Deaths, ages at death: 60 and over	Causes, important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	LIVINGSTON CO. — (*Concluded*)												
27	*Dansville, village*	77	2	72	7	1	40	....	....	....	....	1	....
60	Nunda	19	......	12	2	1	7	....	....	18	1	1	....
28	*Nunda, village*	21	......	24	2	....	19	....	....	18	....	....	....
61	Ossian	7	3	10	1	....	6	....	....	....	....	....	....
62	Portage	13	......	10	....	....	8	....	....	12	....	3	....
63	Sparta	15	1	9	....	....	8	....	....	....	....	....	....
64	Springwater	41	1	21	1	1	14	....	....	15	....	5	....
65	West Sparta	14	......	10	....	....	3	....	....	....	....	....	....
66	York	53	3	26	3	1	15	....	....	24	....	1	....
10	Craig Colony for Epileptics, Sonyea	4	......	113	....	....	7	....	....	....	....	....	....
26	MADISON COUNTY	828	33	629	61	16	369	11	1	77	1	127	3
01	**Oneida, city**	296	13	160	22	3	73	....	....	7	1	33	....
50	Brookfield	38	1	26	1	2	18	1	....	1	....	....	....
20	*Brookfield, village*	2	1	4	....	....	2	....	....	4	....	5	....
51	Casenovia	28	3	17	1	....	12	1	....	5	....	....	....
21	*Casenovia, village*	16	......	23	3	1	15	....	....	6	....	....	....
52	DeRuyter	16	2	8	2	....	6	1	....	....	....	....	....
22	*DeRuyter, village*	6	......	13	....	....	9	....	....	....	....	....	....
53	Eaton	28	2	47	2	2	32	2	1	....	....	3	....
23	*Morrisville, village*	3	......	13	....	....	8	....	....	....	....	4	....
54	Fenner	16	......	10	1	1	7	....	....	2	....	1	....
55	Georgetown	26	1	16	1	....	11	....	....	....	....	1	....
56	Hamilton	29	......	30	5	....	14	2	....	....	....	....	....
(24)	*Earlville, village (0868)* *	10	......	5	....	....	3	....	....	....	....	....	....
25	*Hamilton, village*	17	......	26	1	1	19	1	....	2	....	1	....
57	Lebanon	18	1	16	3	1	9	....	....	4	....	....	....
58	Lenox	33	......	18	2	1	9	....	....	....	....	9	....
26	*Canastota, village*	109	4	71	8	3	34	1	....	3	....	54	3
27	*Wampsville, village*	3	......	5	....	....	4	....	....	....	....	1	....
59	Lincoln	10	1	12	....	....	9	....	....	....	....	4	....
60	Madison	14	......	16	1	1	11	1	....	2	....	1	....
28	*Madison, village*	......	......	6	....	....	5	....	....	....	....	....	....
61	Nelson	19	1	21	1	....	17	....	....	2	....	1	....
62	Smithfield	6	1	10	2	....	6	1	....	5	....	....	....
63	Stockbridge	27	2	13	1	....	11	....	....	2	....	5	....
64	Sullivan	47	......	32	4	....	18	....	....	27	....	4	....
29	*Chittenango, village*	11	......	11	....	....	7	....	....	5	....	....	....
27	MONROE COUNTY	7,688	278	4,538	625	240	1889	34	6	2,452	34	632	28
01	**Rochester, city**	6,732	247	3,608	567	219	1381	15	3	1,814	30	559	28
50	Brighton	22	......	135	....	1	35	....	....	22	....	6	....
51	Chili	25	......	28	....	....	17	....	....	4	....	....	....
52	Clarkson	25	1	18	....	....	14	1	....	....	....	....	....
53	Gates	33	4	22	3	....	13	....	....	....	....	1	....
54	Greece	54	2	35	6	2	16	....	....	4	....	1	....
20	*Charlotte, village*	......	......	......	....	....	....	....	....	....	....	....	....
55	Hamlin	44	2	18	1	1	9	....	....	22	1	1	....
56	Henrietta	21	1	23	1	1	17	....	....	....	1	....	....
57	Irondequoit	108	8	47	8	2	20	6	....	75	1	7	....
58	Mendon	17	......	10	1	....	8	1	....	10	....	....	....
21	*Honeoye Falls, village*	14	......	17	....	1	11	2	1	20	....	1	....

* See Earlville, Chenango

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH																	
REPORTABLE DISEASES												Pneumonia, 91–92				Cancer, 39–45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28–35											
						Pulmonary, 28–29		Other forms, 30–35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
....	....	*1*	....	*4*	*1*	*2*	*2*	....	....	....	*3*	....	*5*	7	....	*54*	*27*
....	....	3	1	....	....	....	....	....	....	....	....	....	....	1	....	9	60
....	....	....	....	....	*1*	....	....	....	....	....	....	....	*2*	*2*	....	*19*	*28*
....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	8	61
....	....	....	....	....	....	....	....	....	....	....	....	1	1	3	....	6	62
....	....	....	....	....	1	....	1	....	....	3	1	....	....	....	....	6	63
23	....	....	....	86	1	....	....	....	1	2	....	1	....	....	....	19	64
....	....	....	....	12	1	....	....	....	....	....	....	1	1	....	....	8	65
30	1	....	....	7	....	3	....	1	1	4	....	5	4	3	....	17	66
....	....	22	1	16	1	1	22	....	....	9	19	5	8	....	....	62	10
68	....	30	1	277	25	51	26	1	1	31	24	40	28	51	8	460	26
2	....	10	1	....	5	4	5	....	....	....	6	8	9	11	5	117	01
4	....	3	....	....	....	2	2	....	....	3	1	2	....	2	....	21	50
3	....	....	....	....	....	....	*1*	....	....	*1*	*1*	....	*1*	....	....	*1*	*20*
1	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	17	51
14	....	*1*	....	....	....	*2*	*2*	....	....	....	....	....	*1*	*2*	....	*18*	*21*
....	....	1	....	4	....	....	....	....	....	....	....	....	....	1	....	7	52
....	....	....	....	....	....	*9*	*2*	....	....	....	*1*	*1*	*3*	....	....	*7*	*22*
15	....	....	....	45	4	4	4	....	....	5	1	2	3	5	....	29	53
2	....	....	....	*53*	....	*1*	....	....	....	....	....	*4*	*1*	1	....	*11*	*23*
....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	9	54
....	....	....	....	22	1	1	....	....	....	....	....	....	....	1	....	14	55
6	....	....	....	30	2	1	1	....	....	2	2	2	....	....	1	24	56
....	....	....	....	*44*	....	....	....	....	....	*1*	....	*4*	*1*	*1*	....	*3*	(*24*)
12	....	*5*	....	*1*	....	....	....	....	....	*7*	*5*	*4*	*1*	*4*	....	*16*	*25*
1	....	2	....	19	1	....	....	....	....	1	....	....	1	2	....	12	57
2	....	....	....	....	1	....	1	....	1	....	....	....	2	....	....	13	58
2	....	*2*	....	....	*4*	*8*	*8*	*1*	....	*1*	*3*	*4*	*2*	6	....	*50*	*26*
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	*5*	*27*
....	....	3	....	1	....	1	2	....	....	1	....	....	....	2	....	8	59
2	....	....	....	....	....	1	....	....	....	....	....	2	....	2	....	14	60
2	....	....	....	....	*1*	*2*	....	....	....	....	....	*1*	....	....	....	*5*	*28*
....	....	....	....	....	2	....	1	....	....	....	....	1	1	3	....	14	61
....	....	....	....	1	1	....	....	....	....	1	....	....	....	1	....	8	62
....	....	1	....	26	2	2	....	....	....	....	....	3	....	2	....	9	63
....	....	....	....	25	....	4	2	....	....	8	4	1	1	4	2	19	64
....	....	*1*	....	*6*	....	*7*	....	....	....	....	....	*1*	*1*	*1*	....	*9*	*29*
427	**22**	**1,694**	**89**	**2,159**	**84**	**744**	**326**	**15**	**41**	**108**	**159**	**644**	**195**	**402**	**155**	**2,997**	**27**
293	**19**	**1,547**	**82**	**1,830**	**63**	**649**	**186**	**11**	**35**	**61**	**130**	**598**	**178**	**334**	**147**	**2,373**	**01**
11	....	44	....	15	....	5	92	....	1	1	....	3	....	3	....	39	50
....	....	1	....	4	1	1	4	....	....	....	....	1	1	2	....	20	51
....	....	....	....	....	1	2	1	....	....	1	1	....	....	1	....	14	52
....	....	....	....	....	....	2	1	....	....	....	....	....	2	....	1	18	53
4	....	22	2	....	....	4	3	....	....	1	....	....	....	3	1	26	54
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	*20*
23	....	9	....	8	....	6	1	....	....	3	1	3	....	3	2	10	55
....	....	....	....	....	....	....	....	....	1	....	....	....	....	2	....	19	56
16	1	21	1	9	....	12	2	....	1	3	1	4	3	6	1	30	57
....	....	....	....	....	1	....	....	....	....	....	....	....	....	3	....	6	59
....	....	*4*	....	*1*	*1*	*1*	....	....	....	*1*	....	....	....	....	....	*15*	*21*

county, for complete total.

Table 17 — New York State (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Deaths (ages at death): Under 1	Deaths (ages at death): 1–4	Deaths (ages at death): 60 and over	Cause (important): Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	MONROE CO.—(*Concluded*)												
59	Ogden	•32	...	15	1	...	8	2	...	3	...	1	...
22	*Spencerport, village*	9	1	12	...	1	9	...	...	1	...	1	...
60	Parma	34	2	25	...	...	14	...	...	47	...	1	...
23	*Hilton, village*	13	...	19	1	...	15	...	...	41	...	...	...
61	Penfield	62	...	28	5	1	15	...	...	27	...	3	...
62	Perinton	30	3	25	2	...	14	...	...	8	...	6	...
24	*East Rochester, village*	87	1	26	3	1	11	...	...	9	...	2	...
25	*Fairport, village*	82	3	44	6	4	27	...	...	9	...	24	...
63	Pittsford (24)	21	1	11	1	...	9	...	...	9	...	6	...
26	*Pittsford, village*	14	...	16	...	...	9	1	1	24	...	7	...
64	Riga	22	...	13	4	1	3	1	1	38	1	...	...
27	*Churchville, village*	6	...	6	1	...	2	...	...	13	...	...	...
65	Rush	17	...	19	2	...	11	1	...	5	...	...	...
66	Sweden	12	1	20	...	1	13	...	...	40	...	4	...
28	*Brockport, village*	43	2	48	3	1	36	4	...	36	...	...	...
67	Webster	55	3	34	5	...	21	...	...	120	...	...	...
29	*Webster, village*	23	1	17	...	2	11	...	...	50	...	...	...
68	Wheatland	18	...	27	2	...	18	...	...	...	...	1	...
30	*Scottsville, village*	13	...	13	2	1	5	...	...	1	...	...	...
10	Rochester State Hospital	...	...	...	159	...	...	97	...	...	...	...	...
28	**MONTGOMERY COUNTY**	1,271	41	794	107	23	379	30	2	307	1	65	...
01	**Amsterdam, city**	835	29	414	72	18	159	28	2	24	...	20	...
50	Amsterdam	27	...	37	2	...	13	...	...	...	...	...	...
20	*Fort Johnson, village*	9	...	5	...	...	4	...	...	...	...	...	...
21	*Hagaman, village*	13	1	5	...	...	2	...	...	5	...	...	...
51	Canajoharie	29	2	17	2	...	12	...	...	5	...	...	...
22	*Canajoharie, village*	41	1	39	3	...	25	...	...	3	...	6	...
52	Charleston	12	1	16	...	1	10	...	...	55	...	...	...
53	Florida	27	1	11	...	...	9	...	...	1	...	...	...
54	Glen	13	...	10	1	...	9	...	...	7	...	...	...
23	*Fultonville, village*	14	...	19	1	1	14	...	...	8	...	1	...
55	Minden	30	...	28	2	...	21	...	...	2	...	...	...
24	*Fort Plain, village*	50	...	48	5	...	27	1	...	1	...	4	...
56	Mohawk	17	...	11	3	1	5	...	...	16	...	7	...
25	*Fonda, village*	23	...	22	...	1	9	...	...	35	...	20	...
57	Palatine	15	1	22	1	...	15	...	...	14	...	...	...
26	*Nelliston, village*	10	...	11	2	...	4	...	...	1	...	1	...
27	*Palatine Bridge, village*	7	1	6	...	...	4	...	...	...	...	...	...
58	Root	18	2	21	2	...	15	...	...	7	...	...	...
59	St. Johnsville	16	...	9	2	...	4	...	...	15	...	1	...
28	*St. Johnsville, village*	65	2	43	9	1	18	1	...	108	1	5	...
29	**NASSAU COUNTY**	2,788	91	1,343	195	90	534	9	4	675	5	200	1
01	**Glen Cove, city**	233	9	80	20	2	32	1	1	14	2	4	...
50	Hempstead	800	25	374	59	24	143	1	1	141	1	88	1
20	*East Rockaway, village*	32	1	17	1	3	8	...	...	1	...	1	...
21	*Floral Park, village (51)*	39	1	19	3	2	11	...	...	40	...	4	...
22	*Freeport, village*	140	3	91	12	2	45	2	2	59	...	13	...
23	*Hempstead, village*	100	1	65	6	4	34	1	...	5	...	2	...
24	*Lawrence, village*	10	1	16	2	1	4	...	...	...	...	...	...
25	*Rockville Center, village*	149	...	63	7	...	29	...	...	75	...	8	...
29	*Cedarhurst, village*	30	1	19	...	...	8	1	...	2	...	17	...
30	*Lynbrook, village*	63	2	50	2	8	25	...	...	9	...	20	...
31	*Long Beach, village*	5	...	9	...	...	5	2	...	18	...	...	...
36	*Woodsburgh, village*	...	...	...	...	...	...	...	...	...	...	...	...
37	Garden City	12	...	9	...	...	4	...	...	2	...	3	...

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES										Pneumonia, 91–92				Cancer, 39–45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28–35: Pulmonary, 28-29		Tuberculosis, 28–35: Other forms, 30–35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
7	...	3	...	...	1	...	...	...	...	...	...	...	...	1	...	13	59
...	...	1	...	...	1	2	...	...	...	1	2	...	...	1	...	8	22
1	...	16	...	7	...	1	...	...	...	...	2	1	1	4	...	18	60
2	...	...	...	18	...	1	1	...	...	1	...	1	...	4	...	14	23
7	...	1	...	1	1	5	1	2	...	...	1	7	2	3	...	20	61
...	...	1	...	1	...	3	...	...	1	2	2	2	1	1	1	19	62
8	...	16	1	88	...	15	1	...	...	6	3	8	2	2	...	27	24
16	...	1	...	1	...	10	5	...	...	7	2	6	1	5	1	30	25
3	...	1	...	24	...	...	...	...	...	5	...	1	...	2	1	8	63
7	...	...	1	2	...	2	2	1	1	2	1	1	...	5	...	5	26
...	1	...	...	3	1	...	...	1	...	3	2	1	...	1	...	6	64
4	...	...	...	8	1	1	1	...	...	...	...	...	...	...	...	4	27
...	...	3	...	...	...	...	...	...	...	...	...	...	...	2	...	17	65
1	...	3	1	...	2	3	1	...	...	2	...	1	...	...	...	16	66
15	...	...	...	...	3	8	2	...	...	3	1	3	2	1	...	39	28
7	...	...	...	1	1	8	3	...	...	4	1	1	1	1	...	27	67
2	...	...	1	4	2	3	1	...	...	1	...	2	...	4	...	9	29
...	1	...	...	55	2	...	3	...	...	...	...	...	...	...	...	21	68
...	...	...	...	79	2	...	...	...	...	...	...	...	1	...	...	10	30
...	...	...	...	...	...	...	15	...	1	...	9	...	...	8	...	126	10
214	3	96	6	1,911	23	83	49	15	13	42	21	118	30	71	19	556	28
160	2	83	5	1,348	20	48	20	9	10	14	13	89	13	33	15	281	01
...	...	...	...	16	...	...	17	...	...	...	1	2	...	3	...	16	50
...	...	...	...	15	...	...	...	...	...	...	...	...	...	1	...	4	20
...	...	...	...	20	...	2	...	...	...	...	...	1	1	...	...	4	21
4	...	3	...	8	...	3	1	1	...	1	...	2	1	1	...	14	51
14	...	2	...	18	...	1	...	...	...	1	...	3	2	8	2	27	22
...	...	...	...	89	...	2	1	...	...	1	...	1	1	3	...	11	52
11	1	1	...	32	...	2	...	...	...	2	...	...	...	1	...	9	53
2	...	...	...	18	...	2	1	1	...	2	...	...	...	2	...	7	54
2	...	1	1	61	1	2	...	...	...	5	...	...	1	3	...	13	23
...	...	1	...	...	...	3	...	...	...	...	...	...	...	1	...	27	55
1	...	...	...	...	...	4	2	...	1	1	2	2	2	3	2	36	24
4	...	1	...	40	...	...	...	...	...	2	...	2	2	...	...	9	56
...	...	1	...	66	1	...	1	1	...	6	1	3	...	2	...	17	25
11	...	2	...	...	1	...	...	...	...	1	1	...	...	...	...	20	57
...	...	...	...	2	...	1	2	...	...	...	...	1	1	2	...	6	26
...	...	...	...	2	...	1	...	...	...	1	1	1	1	1	...	3	27
5	...	...	...	29	...	...	1	...	...	1	...	2	1	2	...	17	58
...	...	...	...	59	...	1	1	...	1	...	...	2	...	2	...	5	59
...	...	1	...	88	...	11	2	3	1	4	2	7	4	3	...	30	28
187	7	187	16	861	31	108	74	18	19	131	59	144	77	111	44	895	29
1	...	9	...	18	2	6	3	...	2	6	5	10	6	3	4	52	01
35	1	79	10	286	6	32	19	9	2	25	19	33	21	26	17	250	50
...	2	1	...	...	1	...	1	...	...	...	...	...	1	1	1	10	20
4	...	7	2	52	...	...	...	...	...	3	2	1	...	3	...	12	21
4	...	19	...	59	4	13	8	1	1	6	2	10	8	11	1	54	22
25	1	15	1	63	...	10	2	1	1	6	...	6	1	9	3	47	23
...	1	...	...	...	1	...	...	...	...	...	...	...	1	...	...	13	24
2	...	22	1	5	1	4	1	1	1	14	...	11	4	10	1	44	25
6	...	...	...	49	2	...	...	...	...	2	...	3	4	4	...	9	29
18	...	12	...	9	...	4	2	...	...	15	5	10	5	4	1	33	30
7	...	2	...	...	...	...	...	...	1	...	1	...	...	...	...	7	31
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	36
...	...	...	...	...	1	...	...	...	...	2	2	1	...	2	...	4	37

Table 17 — New York State (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution·* 1920 — (Continued)

District number	DISTRICT	BIRTHS		DEATHS				CAUSE					
				AGES AT DEATH				IMPORTANT					
								Typhoid fever, 1		Measles, 6		Scarlet fever, 7	
		Living births	Stillbirths	Total deaths at all ages	Under 1	1–4	60 and over	Cases	Deaths	Cases	Deaths	Cases	Deaths
	NASSAU CO. — (*Concluded*)												
51	North Hempstead (21)	479	15	191	46	18	70	1	....	124	1	24	....
26	*Mineola, village*	*244*	*20*	*134*	*13*	*9*	*55*	....	....	*23*	....	*1*	....
32	*Plandome, village*	*5*	......	......	....	....	....	....	....	......	....	......	....
33	**Great Neck Estate, village*	......	......	......	....	....	....	....	....	......	....	......	....
34	**Saddle Rock, village*	......	......	......	....	....	....	....	....	......	....	......	....
35	*Sands Point, village*	......	......	*1*	....	....	....	....	....	......	....	......	....
52	Oyster Bay	377	12	149	19	14	60	....	....	42	....	13	....
27	*Farmingdale, village*	*33*	......	*27*	*1*	*2*	*14*	....	....	*33*	....	......	....
28	*Sea Cliff, village*	*55*	......	*29*	*4*	*1*	*13*	....	....	*87*	*1*	*2*	....
38	Bayville	2	......	......	....	....	....	....	....	......	....	......	....
31	NIAGARA COUNTY	2,928	101	1,569	272	130	546	63	8	1,821	22	572	10
01	**Lockport, city**	417	14	290	43	15	138	6	1	22	....	45	....
02	**Niagara Falls, city**	1,550	60	657	145	81	138	15	4	1,497	21	409	5
03	**North Tonawanda, city**	414	16	191	38	13	50	15	3	23	1	60	4
50	Cambria	24	1	25	1	....	17	....	....	3	....	1	....
51	Hartland	41	......	32	6	....	19	3	....	3	....	8	....
20	*Middleport, village (58)*	*23*	*1*	*15*	*2*	*1*	*10*	....	....	*6*	....	*2*	....
52	Lewiston	42	......	24	2	3	12	18	....	35	....	3	....
21	*Lewiston, village*	*16*	......	*15*	*2*	*1*	*7*	....	....	*4*	....	......	....
53	Lockport	30	......	91	3	2	37	....	....	......	....	3	....
54	Newfane	60	2	56	7	5	20	....	....	26	....	11	....
55	Niagara	6	......	3	....	1	2	....	....	2	....	......	....
22	*La Salle, village*	*72*	*2*	*38*	*8*	*4*	*14*	*2*	....	*88*	....	*9*	*1*
56	Pendleton	18	......	12	....	2	5	....	....	......	....	2	....
57	Porter	22	1	11	3	1	6	1	....	26	....	2	....
23	*Youngstown, village*	*9*	*1*	*9*	....	*1*	*4*	....	....	*30*	....	*1*	....
58	Royalton (20)	51	1	27	3	....	16	....	....	20	....	6	....
59	Somerset	34	......	14	2	....	6	2	....	2	....	......	....
24	*Barker, village*	*6*	......	*3*	*1*	....	*2*	....	....	......	....	......	....
60	Wheatfield	49	1	11	2	....	7	....	....	16	....	4	....
61	Wilson	32	1	32	3	....	22	....	....	12	....	6	....
25	*Wilson, village*	*12*	......	*13*	*1*	....	*8*	*1*	....	*6*	....	......	....
32	ONEIDA COUNTY	4,325	179	2,839	372	150	1239	45	4	1,536	13	255	4
01	**Rome, city**	691	35	489	71	22	210	11	2	367	4	64	....
02	**Utica, city**	2,442	94	1,246	202	89	462	6	1	826	5	81	2
03	**Sherrill, city**	22	3	4	....	....	3	....	....	5	....	15	....
50	Annsville	19	1	24	....	2	14	1	....	5	....	3	....
51	Augusta	15	......	13	3	....	8	....	....	2	....	2	....
20	*Oriskany Falls, village*	*12*	......	*12*	....	....	*8*	....	....	*1*	....	......	....
52	Ava	11	......	5	2	1	1	....	....	......	....	......	....
53	Boonville	26	2	19	....	1	10	1	....	6	....	......	....
21	*Boonville, village*	*29*	*1*	*38*	*1*	*1*	*28*	....	....	......	....	......	....
54	Bridgewater	4	......	6	....	....	3	....	....	......	....	3	....
22	*Bridgewater, village*	*3*	......	*9*	*1*	....	*5*	....	....	......	....	......	....
55	Camden	23	1	20	1	....	17	....	....	......	....	2	....
23	*Camden, village*	*30*	*2*	*30*	*1*	....	*21*	....	....	*2*	....	*6*	....
56	Deerfield	17	......	8	2	....	5	....	....	1	....	......	....
57	Florence	14	1	6	1	....	3	....	....	7	....	......	....
58	Floyd	15	......	10	3	1	5	....	....	8	....	1	....
59	Forestport	11	......	9	1	1	2	1	....	3	2	......	....
24	*Forestport, village*	*9*	......	*7*	....	....	*3*	....	....	*7*	....	*1*	....
60	Kirkland	64	1	47	2	4	28	13	....	7	....	1	....
25	*Clinton, village*	*10*	*2*	*20*	*1*	....	*16*	....	....	......	....	......	....

*** These villages do not, as yet, report separately, their deaths**

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES										Pneumonia, 91–92				Cancer, 39–45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28–35: Pulmonary, 28–29		Tuberculosis, 28–35: Other forms, 30–35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
47	2	7	....	184	5	34	9	5	4	47	17	47	11	16	8	118	51
7	....	1	1	11	2	2	2	1	4	2	2	1	3	9	3	108	26
4	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	32
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	33
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	34
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	35
18	....	11	1	97	4	1	21	....	3	1	8	9	9	9	4	95	52
....	....	....	....	19	1	1	4	....	....	1	1	1	2	2	....	17	27
9	....	2	....	9	1	1	2	....	....	....	....	1	1	2	1	21	28
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	38
728	19	337	32	2,594	67	209	104	33	22	263	68	197	73	82	72	990	31
107	2	11	2	410	11	47	10	6	3	29	8	38	12	13	10	218	01
273	6	214	22	874	22	97	26	17	14	145	44	84	34	28	43	388	02
162	1	58	6	651	11	28	10	4	3	55	8	30	8	10	6	120	03
4	1	1	....	11	3	1	....	....	....	....	....	4	8	1	....	17	50
53	....	3	....	48	....	....	2	....	....	5	1	....	....	5	2	22	51
4	1	....	....	17	1	....	....	....	....	1	1	1	....	3	....	9	20
1	....	16	....	69	1	3	1	1	....	4	2	7	8	4	2	11	52
9	....	3	....	48	1	1	....	....	....	....	....	4	1	....	....	13	21
29	....	1	....	11	1	1	42	2	....	1	1	4	2	4	1	40	53
37	2	8	....	157	2	8	4	1	1	10	1	12	3	4	8	36	54
....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	2	55
12	1	10	1	13	2	11	2	1	....	....	1	3	3	1	....	26	22
....	5	1	....	12	....	....	....	....	....	2	....	2	....	....	....	7	56
1	....	2	....	45	1	1	....	1	....	....	....	....	....	....	3	7	57
3	....	3	1	....	....	....	1	....	....	4	1	....	....	....	....	6	23
15	....	8	....	17	6	4	2	....	....	2	....	1	....	2	....	17	58
12	....	....	....	1	....	2	1	....	....	....	....	1	....	3	....	10	59
6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	24
....	....	3	....	33	....	2	1	....	....	....	....	2	1	2	1	6	60
....	....	....	....	153	4	1	1	....	....	4	....	3	2	1	1	23	61
....	....	....	....	24	....	2	1	....	1	1	....	1	1	1	....	9	25
268	14	271	34	2,007	112	236	184	23	42	215	89	401	167	179	91	1,906	32
41	6	46	5	368	23	42	46	6	8	41	13	51	22	34	18	308	01
101	4	120	19	909	48	107	57	9	21	81	43	218	89	81	54	822	02
3	....	1	....	1	....	5	....	....	....	1	....	7	1	....	....	3	03
....	....	....	....	12	1	4	....	....	....	....	....	5	5	1	....	17	50
....	....	....	....	12	....	1	1	....	....	2	1	3	....	4	....	7	51
....	....	2	....	4	1	1	1	....	....	....	....	....	....	1	....	9	20
....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....	3	52
....	1	2	....	1	1	....	....	....	....	2	....	5	....	1	....	16	53
....	....	3	....	....	....	1	....	....	....	....	3	2	3	2	....	30	21
....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....	4	54
6	1	1	....	....	1	....	....	....	....	1	....	1	....	2	....	5	22
....	....	1	....	6	2	....	....	....	....	3	....	3	2	1	....	15	55
6	....	4	....	92	2	....	....	....	....	5	....	3	1	5	....	22	23
....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	8	56
....	....	....	....	4	....	2	1	....	....	....	....	1	....	1	1	3	57
....	....	....	....	23	1	2	1	....	....	2	1	....	1	....	1	5	58
....	....	2	1	....	2	....	1	....	....	....	....	2	....	1	....	2	59
....	....	....	....	1	....	....	1	1	....	1	....	2	1	....	....	5	24
3	....	3	....	....	2	3	3	....	1	2	....	4	6	4	....	31	60
5	....	7	1	....	....	1	1	....	....	6	....	2	....	1	....	17	25

being included with town in which located (North Hempstead).

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Deaths, ages at death: Under 1	Deaths, ages at death: 1–4	Deaths, ages at death: 60 and over	Cause, important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	ONEIDA CO. — (*Concluded*)												
61	Lee	21	...	17	3	...	10	...	...	19	...	12	...
62	Marcy	15	...	18	...	2	9	1	...	5	...	1	...
63	Marshall	23	...	12	2	...	7	...	...	3	...	1	...
26	*Waterville, village* (67)	10	2	23	1	2	15	...	...	6	...	3	...
64	New Hartford	225	12	155	32	8	62	1	1	28	1	11	...
27	*New Hartford, village*	20	1	25	1	2	13	...	...	...	...	2	1
65	Paris	35	...	24	3	...	9	...	...	1	...	1	...
28	*Clayville, village*	20	2	9	3	...	3	...	...	5	...	...	...
66	Remsen	12	...	6	...	...	4	...	...	2	...	...	...
29	*Remsen, village* (69)	3	1	5	...	...	4	...	...	6	...	...	...
67	Sangerfield (26)	16	...	5	...	...	3	...	...	...	...	...	...
68	Steuben	18	1	6	...	1	4	...	...	4	...	...	...
69	Trenton (29)	35	...	20	3	...	10	...	...	19	...	...	...
30	*Holland Patent, village*	3	...	2	...	...	2	...	...	12	...	...	...
31	*Prospect, village*	5	...	4	1	...	2	...	...	...	...	...	...
32	*Trenton, village*	3	...	4	...	...	3	...	...	...	...	...	...
70	Vernon	24	1	25	2	1	17	...	...	1	...	5	...
33	*Oneida Castle, village*	8	...	8	1	...	4	...	...	...	...	2	...
34	*Vernon, village*	6	...	6	...	...	3	...	...	2	...	...	...
71	Verona	57	1	52	4	...	24	1	...	4	...	2	...
35	*New London, village*	...	...	...	...	...	...	...	...	...	...	...	...
72	Vienna	22	...	29	1	...	14	...	...	...	...	1	...
36	*Sylvan Beach, village*	...	...	...	...	...	...	...	...	...	...	...	...
73	Western	21	...	20	1	...	17	...	...	...	...	4	...
74	Westmoreland	23	2	27	1	1	20	...	...	1	...	...	...
75	Whitestown	146	5	36	9	4	13	...	...	22	...	2	...
37	*Whitesboro, village*	42	3	40	6	...	23	8	...	48	...	5	...
38	*Yorkville, village*	28	3	10	2	2	5	...	...	15	...	...	...
39	*Oriskany, village*	17	1	12	...	...	9	1	...	5	...	6	...
10	Rome Custodial Asylum	...	1	79	4	5	1	...	...	80	1	18	1
11	Utica State Hospital	...	...	138	...	...	77	...	...	1	...	...	...
33	ONONDAGA COUNTY	5,418	245	3,619	532	216	1422	104	9	2,401	22	726	23
01	**Syracuse, city**	4,191	193	2,634	437	176	921	65	7	1,819	22	561	16
50	Camillus	46	3	22	7	1	8	1	...	9	...	11	...
20	*Camillus, village*	14	...	7	1	...	5	...	...	2	...	4	...
51	Cicero	33	1	32	3	...	15	10	...	68	...	13	1
52	Clay	38	...	33	1	1	22	3	1	34	...	3	...
53	DeWitt	68	2	50	8	2	19	...	...	13	...	4	...
21	*East Syracuse, village*	92	3	34	8	3	17	...	...	28	...	12	...
22	*Eastwood, village*	26	3	19	3	3	4	...	...	6	...	3	...
54	Elbridge	21	...	23	1	...	14	...	...	...	...	...	...
23	*Elbridge, village*	5	...	8	...	1	5	...	...	...	...	1	...
24	*Jordan, village*	11	...	20	1	1	11	...	...	...	...	2	...
55	Fabius	16	2	10	...	1	6	...	...	26	...	2	...
25	*Fabius, village*	2	...	2	...	...	1	...	...	...	...	2	...
56	Geddes	17	1	21	5	1	4	...	...	4	...	2	2
26	*Solvay, village*	175	11	59	15	6	18	2	...	59	...	28	2
57	LaFayette	20	2	20	...	...	15	3	...	1	...	1	...
58	Lysander	47	1	24	5	2	14	1	...	63	...	3	...
27	*Baldwinsville, village* (68)	67	1	44	5	3	24	...	...	185	...	8	1
59	Manlius	37	...	39	6	1	15	...	...	8	...	6	...
28	*Fayetteville, village*	25	1	18	1	...	8	...	...	4	...	10	...
34	*Minoa, village*	12	3	8	1	...	2	1	...	16	...	7	...
29	*Manlius, village*	27	3	20	2	1	12	...	...	6	...	...	...
60	Marcellus	36	4	20	1	...	12	3	...	8	...	1	...
30	*Marcellus, village*	21	...	5	...	...	4	...	...	...	...	2	...

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES										Pneumonia, 91–92							
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28–35: Pulmonary, 28–29		Tuberculosis, 28–35: Other forms, 30–35		Broncho, 91		Lobar and unqualified, 92		Cancer, 39–45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
3	...	1	...	68	2	1	1	1	...	5	2	1	...	...	...	12	61
3	...	1	...	85	1	...	1	1	1	3	1	3	1	3	...	10	62
5	...	4	...	23	...	1	1	...	...	...	...	2	...	...	...	11	63
3	...	...	...	...	...	5	1	1	...	6	3	...	...	1	...	18	26
41	1	17	1	1	5	4	6	1	6	...	4	12	3	10	2	115	64
...	...	...	...	1	...	11	6	...	1	...	...	...	3	1	...	13	27
1	...	8	1	58	2	2	...	...	...	...	1	1	...	2	2	16	65
2	...	1	...	10	1	2	...	...	1	2	...	1	...	...	2	5	28
...	...	...	...	...	...	2	...	...	...	...	...	1	1	...	...	5	66
...	...	...	...	3	1	1	...	...	...	...	...	...	...	...	...	4	29
...	...	...	...	1	...	2	...	...	...	3	1	2	...	...	...	4	67
...	...	2	...	...	...	...	1	...	...	...	...	...	2	...	...	3	68
...	...	...	...	45	...	3	1	...	...	1	...	2	1	1	...	17	69
...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	2	30
...	...	...	...	4	...	4	...	...	...	...	...	1	1	...	...	3	31
...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	4	32
3	...	3	...	12	...	1	1	1	...	7	4	6	2	2	2	14	70
...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	8	33
7	...	1	...	14	...	1	1	...	...	7	1	2	...	1	...	3	34
12	...	...	...	47	6	2	1	...	1	1	1	10	...	4	...	39	71
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	35
...	...	1	...	...	3	...	1	...	...	...	...	...	2	2	...	21	72
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	36
...	...	4	1	...	...	...	...	...	...	...	...	...	...	2	1	16	73
5	...	...	...	37	...	4	2	...	...	4	3	2	1	2	...	19	74
...	...	7	3	6	2	6	3	...	1	10	2	5	2	2	1	20	75
11	...	4	...	11	...	8	2	...	...	4	1	12	1	3	1	32	37
...	...	15	1	...	...	4	...	...	1	2	...	1	1	1	...	6	38
5	...	2	...	13	...	1	2	2	...	1	...	...	...	...	...	10	39
2	1	7	1	175	5	...	30	...	...	12	2	25	4	...	6	28	10
...	...	1	...	...	...	...	10	...	...	...	2	...	7	3	...	116	11
230	14	472	43	1,053	93	297	190	13	43	372	229	240	263	218	158	2,314	33
114	9	407	31	713	52	244	81	7	37	314	182	153	207	161	132	1,697	01
...	1	1	...	...	1	1	...	...	...	2	3	1	...	...	3	14	50
1	...	1	...	...	...	4	...	...	...	1	...	...	...	1	...	6	20
3	...	13	2	56	2	6	1	1	...	4	2	9	1	...	1	22	51
4	...	4	...	24	...	5	1	...	...	5	3	5	2	5	...	21	52
2	...	5	1	6	3	...	1	...	...	1	2	4	5	...	2	36	53
1	...	...	...	...	2	8	...	...	...	2	3	7	3	1	2	23	21
...	...	...	...	1	...	1	3	...	...	1	2	1	1	1	1	11	22
7	...	...	...	...	1	1	2	...	...	...	...	1	5	3	1	11	54
...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	7	23
...	1	...	...	...	1	2	2	...	...	...	1	1	1	3	1	10	24
...	...	...	...	...	...	3	...	...	...	...	...	...	...	2	...	8	55
...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	2	25
...	...	...	...	...	1	...	1	...	...	...	...	1	...	...	2	15	56
...	...	1	...	...	2	...	4	1	1	...	7	1	2	2	3	36	26
1	...	...	...	...	1	1	3	...	...	3	...	1	1	2	...	13	57
8	...	5	...	7	1	2	1	...	...	...	...	1	2	1	1	18	58
26	...	6	1	12	3	1	...	...	1	10	2	12	2	3	2	29	27
2	...	2	2	27	2	3	3	1	1	4	2	6	5	2	...	22	59
2	...	3	3	58	2	1	1	1	2	3	...	6	...	1	...	9	28
...	...	1	...	3	1	...	...	...	...	...	...	1	1	...	...	6	34
...	...	2	...	...	2	2	...	1	...	3	1	2	3	3	...	11	29
2	...	...	...	8	...	2	2	...	...	...	1	4	...	3	...	14	60
...	...	1	...	...	...	...	...	...	...	1	...	1	...	1	...	4	30

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS: Living births	BIRTHS: Stillbirths	DEATHS: Total deaths at all ages	DEATHS, AGES AT DEATH: Under 1	DEATHS, AGES AT DEATH: 1–4	DEATHS, AGES AT DEATH: 60 and over	CAUSES, IMPORTANT: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	ONONDAGO CO. — (*Concluded*)												
61	Onondaga	99	2	244	6	5	136	4	....	1	....	9	....
62	Otisco	14	1	12	....	....	8	1	1	2	....	....	....
63	Pompey	30	....	21	2	....	16	1	....	9	....	1	....
64	Salina	48	2	23	8	4	5	....	....	4	....	2	....
31	*Liverpool, village*	*26*	*1*	*19*	*1*	....	*14*	*2*	....	....	....	....	....
65	Skaneateles	53	2	42	8	2	21	4	....	10	....	8	....
32	*Skaneateles, village*	*20*	*1*	*24*	*2*	*1*	*15*	....	....	*1*	....	*11*	....
66	Spafford	24	....	13	2	1	6	1	....	....	....	....	....
67	Tully	18	....	12	1	....	8	....	....	1	....	....	....
33	*Tully, village*	*6*	....	*6*	....	....	*5*	....	....	*5*	....	*2*	....
68	Van Buren (27)	33	2	22	1	....	11	....	....	9	....	7	1
10	Syracuse Institution for Feeble-minded	....	....	9	....	....	1	2	....	....	....	....	....
34	ONTARIO COUNTY	1,094	47	871	91	23	483	19	2	537	4	189	6
01	**Canandaigua, city**	216	8	176	8	5	109	....	1	31	....	56	1
02	**Geneva, city**	378	15	235	47	11	94	4	....	250	2	56	4
50	Bristol	14	1	14	3	....	8	....	....	4	....	....	....
51	Canadice	7	1	4	....	1	3	1	....	....	....	....	....
52	Canandaigua	25	1	28	1	1	17	....	....	....	....	29	....
53	East Bloomfield	15	....	13	....	1	5	....	....	14	....	1	....
27	*East Bloomfield, village*	....	....	*4*	....	....	*4*	....	....	....	....	....	....
28	*Holcomb, village*	*4*	....	*7*	....	....	*5*	....	....	*2*	....	....	....
54	Farmington	29	....	15	2	1	7	1	....	2	....	3	....
55	Geneva	19	....	12	2	1	7	1	....	14	....	3	1
56	Gorham	18	....	35	2	....	23	....	....	....	....	3	....
(20)	*Rushville, village*	....	....	....	....	....	....	....	....	....	....	....	....
[20†	*Rushville, village (6,156)*	*5*	....	*10*	*1*	....	*9*	....	....	....	....	....	....
57	Hopewell	10	....	31	....	....	27	....	....	3	....	1	....
58	Manchester	27	2	26	....	....	19	....	....	9	....	2	....
21	*Clifton Springs, village (60)*	*75*	*2*	*82*	*3*	*1*	*44*	....	....	*1*	....	....	....
22	*Manchester, village*	*45*	*4*	*14*	*2*	....	*5*	....	....	....	....	*27*	....
23	*Shortsville, village*	*15*	*1*	*12*	*3*	....	*6*	*4*	....	*92*	*1*	....	....
59	Naples	17	....	11	2	....	7	....	....	6	....	....	....
24	*Naples, village*	*6*	....	*17*	....	....	*11*	....	....	....	....	....	....
60	Phelps (21)	38	2	28	1	....	22	3	....	56	1	4	....
25	*Phelps, village*	*12*	*1*	*23*	*2*	....	*15*	*2*	*1*	*6*	....	....	....
61	Richmond	20	1	12	2	1	5	....	....	4	....	2	....
62	Seneca	33	1	21	2	....	13	3	....	32	....	1	....
63	South Bristol	14	3	10	2	....	4	....	....	....	....	....	....
64	Victor	26	3	19	4	....	11	....	....	11	....	....	....
26	*Victor, village*	*12*	....	*10*	*1*	....	*6*	....	....	....	....	....	....
65	West Bloomfield	19	1	12	2	....	8	....	....	....	....	1	....
35	ORANGE COUNTY	2,365	106	1,929	213	64	834	29	6	776	3	346	2
01	**Middletown, city**	310	26	275	25	11	139	2	1	382	1	145	1
02	**Newburgh, city**	675	29	498	62	10	188	10	3	109	....	62	....
03	**Port Jervis, city**	249	7	202	23	8	71	1	....	26	....	11	....
50	Blooming Grove	29	....	17	1	1	10	....	....	....	....	....	....
20	*Washingtonville, village*	*10*	....	*8*	*2*	*1*	*4*	....	....	*3*	....	*1*	....
51	Chester	19	....	20	2	2	9	1	....	13	....	1	....
21	*Chester, village*	*13*	*1*	*14*	*1*	....	*6*	*3*	*1*	*7*	....	*1*	....
52	Cornwall	25	2	32	1	1	18	....	....	21	....	8	....
22	*Cornwall, village*	*26*	*1*	*28*	*2*	*2*	*17*	....	....	*94*	....	*16*	....

† Rushville, village, located in two counties, Ontario

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

Reportable diseases: Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35: Pulmonary, 28-29		Tuberculosis, 28-35: Other forms, 30-35		Pneumonia, 91-92: Broncho, 91		Pneumonia, 91-92: Lobar and unqualified, 92		Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All Other causes	District number
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
...	2	2	1	...	8	3	73	...	...	1	12	1	6	6	2	134	61
21	...	...	...	...	2	1	...	...	...	4	...	...	...	2	...	7	62
2	...	3	...	7	2	1	...	...	...	2	2	...	...	1	...	16	63
1	...	3	...	...	1	1	...	...	...	2	2	3	3	2	2	13	64
...	...	*5*	...	*20*	...	*2*	...	...	...	*4*	...	*6*	*3*	...	...	*16*	*31*
8	...	4	2	88	1	2	2	1	...	3	...	9	3	3	1	30	65
...	...	...	...	...	...	...	...	...	...	*1*	*2*	...	*1*	*2*	*1*	*18*	*32*
10	1	...	...	...	...	...	2	...	...	...	...	...	...	1	1	8	66
1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	12	67
10	...	...	...	...	*1*	...	...	...	...	...	...	*1*	*1*	*2*	...	*2*	*33*
4	...	3	...	19	1	...	...	...	...	...	...	2	5	4	...	11	68
...	...	...	...	...	...	...	6	...	1	...	...	...	...	...	...	2	10
63	6	55	3	1,070	29	89	30	7	3	68	26	118	43	82	20	617	34
2	...	14	1	43	1	8	3	...	2	17	7	30	10	17	1	132	01
9	2	27	1	397	12	23	8	2	...	21	8	46	14	16	16	152	02
...	...	...	...	2	...	2	...	...	...	...	...	...	...	1	1	12	50
...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	4	51
...	...	...	1	11	1	1	2	...	...	...	...	4	4	2	...	18	52
...	...	2	...	...	1	...	7	...	...	...	...	...	...	...	...	5	53
...	...	...	...	...	...	*1*	...	...	...	*1*	...	...	...	*1*	...	*3*	*27*
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	*28*
12	...	...	...	4	2	4	...	...	...	5	...	2	1	2	...	10	54
7	...	...	...	5	...	2	...	...	...	...	...	...	...	...	1	10	55
1	...	1	...	1	...	...	2	...	...	1	3	1	1	3	...	26	56
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*(20)*
...	...	...	...	...	*1*	*1*	...	...	...	...	...	...	...	*1*	...	*8*	†*20*]
...	...	...	...	30	1	1	1	...	...	...	2	...	4	1	...	22	57
...	...	...	...	11	...	1	...	...	...	...	...	2	...	3	...	23	58
...	...	...	...	*75*	*1*	*4*	...	...	...	*11*	*4*	*4*	*1*	*12*	...	*64*	*21*
...	*3*	...	...	...	...	*1*	...	...	...	...	...	...	...	*2*	...	*9*	*22*
11	*1*	...	...	*41*	*2*	*2*	...	...	...	*4*	*1*	...	...	...	...	*7*	*23*
10	...	...	...	23	...	4	...	1	...	...	...	3	1	1	...	9	59
1	...	...	...	*23*	...	*8*	*2*	...	...	...	...	*1*	...	*3*	...	*12*	*24*
...	...	4	...	204	1	...	...	...	...	4	...	9	2	5	1	18	60
1	...	*4*	...	*172*	*4*	*3*	*1*	...	...	*3*	...	*7*	...	*4*	...	*13*	*25*
...	...	...	...	...	2	5	3	1	...	...	...	1	...	...	...	7	61
2	...	...	...	15	1	4	1	2	...	...	...	4	4	4	...	11	62
...	...	...	...	...	...	1	...	...	...	...	...	1	1	...	...	9	63
2	...	...	...	12	...	4	...	1	1	...	...	1	...	4	...	14	64
...	...	*3*	...	...	...	*1*	...	...	...	*1*	*1*	*1*	...	...	...	*9*	*26*
5	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	11	65
261	11	166	14	1,213	83	205	175	20	18	174	66	184	103	130	41	1,277	35
24	...	34	4	343	21	31	13	6	3	62	8	22	8	22	1	192	01
75	4	30	3	11	3	60	52	5	5	28	12	57	35	33	12	336	02
75	...	17	2	19	16	17	18	3	1	17	5	18	13	13	8	126	03
...	1	...	...	...	...	...	1	...	...	...	...	...	...	1	...	14	50
...	...	...	...	...	...	*1*	*2*	...	...	...	...	...	*1*	...	*1*	*4*	*20*
3	...	1	...	45	2	1	4	...	...	...	1	3	1	...	1	11	51
...	...	*3*	...	*158*	*1*	*4*	*4*	...	...	*1*	...	*12*	...	*2*	...	*6*	*21*
9	...	3	...	20	4	4	1	...	...	3	...	6	1	2	...	24	52
11	...	*5*	...	*4*	*2*	*3*	...	...	...	*5*	*4*	*5*	*2*	*2*	*3*	*15*	*22*

and Yates. Total for entire village in bracketed line.

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS		DEATHS				CAUSE — IMPORTANT					
					AGES AT DEATH			Typhoid fever, 1		Measles, 6		Scarlet fever, 7	
		Living births	Stillbirths	Total deaths at all ages	Under 1	1–4	60 and over	Cases	Deaths	Cases	Deaths	Cases	Deaths
	ORANGE Co. — (*Concluded*)												
53	Crawford	16	1	15	....	1	10	....	....	2	....	1	....
54	Deerpark	20	1	30	4	1	14	....	....	3	....	....	....
55	Goshen	29	3	49	4	1	32	....	....	2	....	2	....
23	*Goshen, village*	*60*	*1*	*51*	*8*	*2*	*26*	*3*	....	*3*	....	*4*	....
56	Greenville	12	......	8	1	....	6	....	....	....	....	....	....
57	Hamptonburg	23	......	9	....	....	6	....	....	....	....	1	....
58	Highlands	54	3	16	....	1	2	....	....	9	....	....	....
24	*Highland Falls, village*	*65*	*3*	*25*	*2*	*2*	*7*	*1*	....	*4*	....	*4*	....
59	Minisink	18	......	18	2	1	10	1	....	....	....	....	....
25	*Unionville, village*	*7*	......	*8*	....	....	*4*	....	....	....	....	*3*	....
60	Monroe	15	......	9	....	....	3	....	....	2	....	....	....
26	*Monroe, village*	*25*	*4*	*21*	*6*	*1*	*10*	....	....	....	*1*	....	....
30	*Harriman, village*	*6*	*2*	*9*	*1*	....	*4*	....	....	....	....	....	....
61	Montgomery	59	3	38	7	1	18	....	....	4	....	....	....
27	*Montgomery, village*	*11*	......	*11*	*1*	....	*7*	....	....	*5*	....	....	....
28	*Walden, village*	*80*	*3*	*48*	*5*	*2*	*25*	*4*	*1*	*8*	....	*24*	....
62	Mount Hope	26	1	32	4	....	4	1	....	3	....	4	....
63	Newburgh	75	1	54	10	1	26	1	....	4	....	5	....
64	New Windsor	74	......	41	6	5	13	....	....	6	1	7	1
65	Tuxedo	71	1	42	6	....	8	....	....	12	....	7	....
66	Wallkill	45	......	36	2	1	20	....	....	2	....	5	....
67	Warwick	110	3	46	12	4	17	....	....	20	....	26	....
29	*Warwick, village*	*43*	*4*	*32*	*2*	*2*	*18*	*1*	....	*2*	....	*3*	....
68	Wawayanda	31	3	16	6	1	6	....	....	24	....	9	....
69	Woodbury	34	3	30	4	1	12	....	....	6	....	....	....
10	Middletown State Hospital	......	......	141	1	....	69	....	....	....	....	1	....
36	ORLEANS COUNTY	547	24	414	35	18	243	6	2	163	3	37	....
50	Albion	14	......	38	....	....	25	....	....	5	....	1	....
20	*Albion, village (54)*	*115*	*4*	*94*	*8*	*6*	*49*	*1*	*2*	*11*	*3*	*1*	....
51	Barre	30	2	17	2	1	9	....	....	5	....	....	....
52	Carlton	26	......	12	1	[illegible]	4	....	....	8	....	....	....
53	Clarendon	22	1	10	....	....	5	....	....	5	....	....	....
54	Gaines (20)	18	......	17	4	....	10	....	....	1	....	....	....
55	Kendall	22	3	26	5	....	18	....	....	19	....	....	....
56	Murray	33	1	17	....	2	12	2	....	6	....	....	....
21	*Holley, village*	*27*	*1*	*19*	*3*	....	*11*	....	....	*19*	....	....	....
57	Ridgeway	55	3	23	4	....	13	1	....	4	....	8	....
22	*Medina, village (58)*	*120*	*7*	*85*	*7*	*6*	*48*	*2*	....	*80*	....	*12*	....
58	Shelby (22)	32	1	23	....	....	17	....	....	....	....	11	....
59	Yates	24	1	22	1	....	13	....	....	....	....	4	....
23	*Lyndonville, village*	*9*	......	*11*	....	....	*9*	....	....	....	....	....	....
37	OSWEGO COUNTY	1,547	51	1,055	121	46	591	21	2	1,612	22	106	1
01	**Fulton, city**	316	15	176	28	18	76	1	....	322	8	14	....
02	**Oswego, city**	565	16	284	42	15	139	4	1	661	7	35	....
50	Albion	14	......	18	1	....	12	4	1	....	....	3	....
20	*Altmar, village*	*4*	......	*3*	....	....	*3*	....	....	....	....	....	....
51	Amboy	17	......	9	1	....	8	....	....	....	....	....	....
52	Boylston	10	1	5	....	....	2	....	....	....	....	....	....
53	Constantia	15	1	25	3	....	13	....	....	14	....	8	....
21	*Cleveland, village*	*9*	......	*12*	....	*1*	*7*	....	....	*58*	....	*1*	*1*
54	Granby	47	......	34	7	4	18	....	....	17	....	2	....
55	Hannibal	19	......	18	....	....	15	....	....	22	....	1	....
22	*Hannibal, village*	*3*	......	*12*	*1*	....	*10*	....	....	*20*	....	*1*	....

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES										Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All Other causes	District number
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Broncho, 91		Lobar and unqualified, 92					
						Pulmonary, 28-29		Other forms, 30-35									
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
9	...	5	...	24	...	...	1	...	...	2	1	1	1	3	...	9	53
...	...	5	...	...	1	4	1	...	...	1	1	...	1	3	1	22	54
1	...	6	...	11	2	3	2	...	...	2	1	1	4	4	1	35	55
3	...	4	1	19	1	6	3	1	1	3	2	5	5	5	...	33	23
...	...	3	1	...	...	...	...	...	...	...	...	...	1	...	...	6	56
...	...	...	...	...	1	...	...	1	...	...	1	...	...	...	...	7	57
1	...	3	...	...	2	6	1	...	...	1	...	1	1	1	...	11	58
1	...	6	...	...	...	8	2	...	...	3	1	...	1	4	...	17	24
...	...	...	...	7	1	...	1	...	...	1	...	2	1	2	1	12	59
...	...	...	...	2	1	...	...	...	...	1	...	3	2	...	...	5	25
...	...	1	...	...	...	2	...	...	...	1	1	1	1	1	...	6	60
...	...	...	...	...	...	...	2	...	...	...	3	...	1	1	...	13	26
3	...	...	...	...	...	...	1	...	1	1	1	2	1	1	...	4	30
6	1	1	1	23	2	2	...	...	...	1	1	1	1	1	2	29	61
6	1	1	...	5	...	...	1	...	...	2	...	3	...	1	...	8	27
8	...	7	1	57	2	12	6	...	1	9	3	3	...	3	...	31	28
...	...	1	...	7	...	11	21	...	...	6	1	4	...	1	...	9	62
5	2	...	...	4	1	7	4	...	...	3	1	2	4	2	1	39	63
...	1	2	...	4	...	2	1	1	1	2	4	...	2	2	2	26	64
1	...	3	...	2	4	1	1	...	...	5	2	2	1	5	3	26	65
8	...	5	1	3	1	4	6	1	...	2	2	1	1	4	...	21	66
1	...	7	...	31	1	11	2	...	2	4	2	6	8	4	3	29	67
1	...	12	...	32	...	2	2	1	1	6	3	7	4	3	...	19	29
2	1	1	...	65	...	2	2	...	...	1	3	12	...	...	...	10	68
8	...	...	...	...	...	1	1	1	2	1	1	1	2	1	1	22	69
...	...	...	...	317	14	...	19	...	...	...	1	3	4	3	...	100	10
59	2	14	2	231	4	32	14	...	5	17	12	24	19	49	6	296	36
...	...	...	...	...	...	...	...	...	...	...	...	1	1	6	...	31	50
1	1	2	...	...	2	8	4	...	1	...	1	3	5	11	3	61	20
26	...	2	...	66	...	...	...	...	...	1	1	1	2	1	...	13	51
3	...	1	...	16	...	1	...	...	...	1	2	...	1	1	...	8	52
...	...	...	...	1	...	3	2	...	...	...	...	2	...	...	...	8	53
3	1	1	...	1	...	...	1	...	...	...	...	...	...	1	...	14	54
5	...	2	...	70	1	2	...	...	...	3	2	5	1	5	...	17	55
...	...	1	1	24	...	1	1	...	1	1	...	2	...	1	...	13	56
2	...	1	...	...	...	5	...	...	1	2	...	3	...	2	...	16	21
...	...	2	...	8	...	...	...	...	...	...	1	...	...	3	1	18	57
...	...	1	1	34	...	9	4	...	1	3	2	5	6	11	2	58	22
...	...	...	...	...	...	...	...	...	...	4	1	...	1	3	...	18	58
13	...	1	...	11	1	2	1	...	1	...	1	2	1	2	...	15	59
6	...	...	...	...	...	1	1	...	...	2	1	...	1	2	...	6	23
89	6	82	7	102	34	95	32	4	2	103	27	120	44	98	25	755	37
15	2	23	3	1	11	43	6	...	1	13	3	23	15	19	9	99	01
19	1	27	2	21	...	34	6	2	1	48	8	54	10	25	8	215	02
...	1	1	...	...	...	...	...	...	...	...	1	1	...	1	...	14	50
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	20
...	...	...	...	10	...	...	...	...	...	...	...	1	1	1	...	7	51
...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	5	52
6	...	...	...	...	2	1	...	...	...	2	1	1	2	1	...	19	53
6	...	...	...	...	1	...	...	...	...	2	1	...	...	...	...	9	21
4	...	3	...	...	2	...	1	1	...	...	...	...	...	3	3	25	54
...	...	2	1	4	1	...	...	...	...	...	...	...	1	2	...	13	55
...	...	...	...	...	...	1	...	...	...	...	...	...	1	3	...	8	22

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Deaths, ages at death: Under 1	Deaths, ages at death: 1–4	Deaths, ages at death: 60 and over	Causes, important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	OSWEGO CO. — (*Concluded*)												
56	Hastings	31	3	29	6	....	19	1	....	9	....	4	....
23	*Central Square, village*	*4*	.....	*10*	*1*	....	*6*	....	....	*4*	....	.....	....
57	Mexico	31	2	47	....	....	34	....	....	4	....	1	....
24	*Mexico, village*	*21*	*2*	*35*	*2*	*1*	*26*	....	....	*45*	....	*4*	....
58	New Haven	24	1	23	2	....	15	....	....	11	....	.....	....
59	Orwell	17	2	29	2	1	10	....	....	2	1	.....	....
60	Oswego	39	.....	20	1	....	15	....	....	80	....	.....	....
61	Palermo	16	1	5	....	....	3	1	....	17	....	5	....
62	Parish	27	.....	14	2	....	9	....	....	4	....	.....	....
25	*Parish, village*	*11*	.....	*10*	....	....	*7*	*1*	....	*1*	....	.....	....
63	Redfield	18	1	5	1	....	4	....	....	.....	....	.....	....
64	Richland	39	1	31	4	1	20	3	....	32	....	1	....
26	*Pulaski, village*	*28*	.....	*36*	*1*	....	*25*	....	....	*10*	....	*3*	....
65	Sandy Creek	20	.....	14	3	....	7	1	....	9	....	4	....
27	*Lacona, village*	*6*	.....	*12*	*1*	....	*9*	....	....	*4*	....	.....	....
28	*Sandy Creek, village*	*9*	.....	*12*	....	....	*11*	....	....	*5*	....	.....	....
66	Schroeppel	27	2	15	3	....	5	....	....	60	2	6	....
29	*Phoenix, village*	*34*	*2*	*16*	*2*	*1*	*11*	....	....	*87*	....	*4*	....
67	Scriba	37	.....	26	1	2	16	....	....	10	1	1	....
68	Volney	46	.....	31	3	1	18	3	....	40	3	5	....
69	West Monroe	10	.....	4	1	....	1	1	....	2	....	3	....
70	Williamstown	15	.....	15	....	1	10	1	....	.....	....	.....	....
71	Minetto	18	1	20	2	....	7	....	....	61	....	.....	....
38	**OTSEGO COUNTY**	**818**	**37**	**722**	**49**	**15**	**417**	**17**	**1**	**146**	....	**104**	**4**
01	**Oneonta, city**	**254**	**14**	**188**	**13**	**5**	**85**	**7**	**1**	**25**	....	**42**	**1**
50	Burlington	30	.....	15	....	....	9	1	....	4	....	.....	....
51	Butternuts	20	.....	17	1	....	7	....	....	.....	....	.....	....
20	*Gilbertsville, village*	*3*	.....	*6*	*1*	....	*4*	....	....	.....	....	.....	....
52	Cherry Valley	9	.....	11	1	....	8	....	....	1	....	.....	....
21	*Cherry Valley, village*	*9*	.....	*12*	....	*1*	*9*	....	....	*2*	....	*2*	....
53	Decatur	3	1	2	....	....	1	....	....	2	....	.....	....
54	Edmeston	19	.....	26	1	....	17	....	....	.....	....	.....	....
55	Exeter	17	.....	12	1	....	11	....	....	.....	....	.....	....
56	Hartwick	31	.....	15	3	1	7	....	....	4	....	1	....
57	Laurens	16	1	29	1	....	15	....	....	.....	....	6	....
22	*Laurens, village*	*2*	.....	*7*	....	....	*5*	....	....	.....	....	.....	....
58	Maryland	18	2	22	2	1	13	....	....	20	....	2	....
23	*Schenevus, village*	*10*	*1*	*8*	....	....	*4*	....	....	*50*	....	*3*	....
59	Middlefield	15	1	39	5	1	28	....	....	.....	....	3	1
24	*Cooperstown, village*	*63*	*2*	*43*	*3*	*2*	*23*	*1*	....	*26*	....	*6*	....
60	Milford	27	1	17	4	....	6	....	....	3	....	1	1
25	*Milford, village*	*9*	*1*	*8*	*1*	....	*6*	....	....	.....	....	*8*	....
61	Morris	10	.....	4	....	....	1	....	....	.....	....	.....	....
26	*Morris, village*	*2*	.....	*10*	*1*	....	*9*	....	....	.....	....	.....	....
62	New Lisbon	12	1	13	....	....	12	1	....	.....	....	1	....
63	Oneonta	21	1	21	2	1	13	1	....	1	....	3	....
64	Otego	17	.....	9	....	....	6	1	....	.....	....	.....	....
27	*Otego, village*	*4*	.....	*9*	....	....	*6*	*3*	....	.....	....	.....	....
65	Otsego	14	.....	22	....	2	12	1	....	.....	....	1	1
66	Pittsfield	16	1	6	1	....	2	....	....	.....	....	.....	....
67	Plainfield	8	2	11	1	....	8	....	....	1	....	.....	....
68	Richfield	8	.....	5	....	....	5	....	....	.....	....	.....	....
28	*Richfield Springs, village*	*20*	.....	*17*	*3*	....	*8*	....	....	.....	....	.....	....
69	Roseboom	10	.....	13	....	....	11	....	....	.....	....	.....	....
70	Springfield	28	.....	13	....	....	8	....	....	3	....	1	....
71	Unadilla	20	1	16	1	....	10	....	....	.....	....	.....	....

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8 — Cases	Whooping cough, 8 — Deaths	Diphtheria, 9 — Cases	Diphtheria, 9 — Deaths	Influenza, 10 — Cases	Influenza, 10 — Deaths	Tuberculosis, 28-35: Pulmonary, 28-29 — Cases	Tuberculosis, 28-35: Pulmonary, 28-29 — Deaths	Tuberculosis, 28-35: Other forms, 30-35 — Cases	Tuberculosis, 28-35: Other forms, 30-35 — Deaths	Pneumonia, 91-92: Broncho, 91 — Cases	Pneumonia, 91-92: Broncho, 91 — Deaths	Pneumonia, 91-92: Lobar and unqualified, 92 — Cases	Pneumonia, 91-92: Lobar and unqualified, 92 — Deaths	Cancer, 39-45 — Deaths	Diarrhea and enteritis (under 2 years), 104 — Deaths	All other causes	District number
		1		9						1	1	7	2	1		25	56
				14	*3*	*1*				*2*	*1*			*2*		*4*	*23*
21		7			1					3				5		41	57
1		*4*		*2*	*3*	*3*				*4*	*2*	*4*		*5*		*25*	*24*
6				1		1		1		7		2	1	3		19	58
		1				1	15				1	2	2	2	1	7	59
		1		7	1							3	1	1	1	16	60
		3		8		2						1	1			4	61
		1		4								1	1	2	1	10	62
				1			*1*					*1*	*1*			*8*	*25*
											1					4	63
				1						3	2	4	1	5		23	64
		5	*1*		*1*					*1*		*1*	*1*	*4*		*29*	*26*
					1	3	1			4	2	1				10	65
					1	*2*				*3*				*1*		*10*	*27*
		1										*1*				*12*	*28*
										2	1	3		2		10	66
11	*2*				*1*					*4*		*3*		*1*		*12*	*29*
					1					2			1	2	2	19	67
				17	2	1	1			1		4	2	5		18	68
		2										1				4	69
											2					13	70
				2	2		1			1		1		1		16	71
76	**1**	**88**	**6**	**832**	**21**	**36**	**30**	**4**	**3**	**43**	**21**	**68**	**38**	**49**	**5**	**543**	**38**
4		55	3	46	5	7	2			11	8	16	17	20	1	130	01
				14	1		2					1		1		11	50
					1		1					6	5	2		8	51
														1		*5*	*20*
				16		1	2	1				1				9	52
5	*1*			*20*		*1*						*3*	*1*	*1*		*9*	*21*
				5		1				1						2	53
											2		1	2		21	54
													1	1		10	55
				230	2	5	1			3		4	2			10	56
		5		17	1		9			1		3	1	3		15	57
				26			*1*					*5*				*6*	*22*
		4		44		4	1			4	1	2		1		19	58
		1		*13*		*1*	*1*			*1*				*2*		*5*	*23*
				21									2	1		35	59
7		*13*	*2*	*1*	*1*	*2*	*3*	*2*	*1*	*4*	*3*	*2*	*1*	*1*	*1*	*30*	*24*
				1		2	1				1	1		1		13	60
		1	*1*	*2*									*1*	*1*		*5*	*25*
4				94	1					6		7				3	61
														1		*9*	*26*
		1		12	1	1						2		2		10	62
8		6		13		1				2	1	1		1		19	63
8				22	2	3				4	2	1				5	64
5				*30*		*2*	*1*					*1*				*8*	*27*
9				6		2		1	1	1		3	2		1	17	65
				34						3		3	1			5	66
1							1				1					9	67
																5	68
				1		*1*	*2*							*3*	*1*	*11*	*28*
				14												13	69
				31												13	70
3									1		2					13	71

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS		DEATHS				CAUSES					
					AGES AT DEATH			IMPORTANT					
								Typhoid fever, 1		Measles, 6		Scarlet fever, 7	
		Living births	Stillbirths	Total deaths at all ages	Under 1	1–4	60 and over	Cases	Deaths	Cases	Deaths	Cases	Deaths
	OTSEGO CO. — (*Concluded*)												
29	*Unadilla, village*	12	1	35	2	1	18	....	....	2	....	....	....
72	Westford	17	.....	8	....	....	7	....	....	....	....	....	....
73	Worcester	44	6	33	1	....	23	1	....	2	....	24	....
39	PUTNAM COUNTY	230	5	170	9	5	111	1	....	68	....	19	....
50	Carmel	58	2	43	....	4	29	....	....	46	....	3	....
51	Kent	13	.....	22	1	....	18	....	....	....	....	....	....
52	Patterson	17	1	19	3	....	13	....	....	1	....	1	....
53	Phillipstown	26	.....	15	2	....	4	....	....	14	....	6	....
20	*Cold Spring, village*	21	.....	28	2	1	17	1	....	4	....	8	....
21	*Nelsonville, village*	16	.....	10	....	....	4	....	....	....	....	....	
54	Putnam Valley	13	.....	11	1	....	9	....	....	....	....	....	....
55	Southeast	27	1	13	....	....	11	....	....	2	....	....	....
22	*Brewster, village*	39	1	9	....	....	6	....	....	1	....	1	....
41	RENSSELAER COUNTY	1,947	100	1,851	180	74	857	37	5	635	4	115	3
01	**Rensselaer, city**	101	10	114	10	1	59	8	....	13	....	12	....
02	**Troy, city**	1,385	74	1,222	142	63	510	15	4	474	4	45	3
50	Berlin	16	2	14	2	....	7	....	....	1	....	8	....
51	Brunswick	51	1	36	2	....	21	3	....	23	....	4	....
52	East Greenbush	21	1	23	....	....	16	....	....	2	....	1	....
53	Grafton	13	.....	11	....	....	7	3	....	....	....	2	....
54	Hoosick	33	1	26	1	....	15	....	....	1	....	4	....
20	*Hoosick Falls, village*	87	2	76	1	5	42	....	....	2	....	6	....
55	Nassau	16	.....	28	3	1	21	....	....	5	....	3	....
21	*Nassau, village*	7	.....	17	....	....	15	....	....	....	....	10	....
56	North Greenbush	15	.....	77	1	1	16	1	1	....	....	....	....
57	Petersburg	17	.....	20	4	....	10	....	....	8	....	11	....
58	Pittstown	25	3	27	2	1	16	1	....	24	....	....	....
22	*Valley Falls, village* (61)	16	1	10	1	1	4	....	....	51	....	....	....
59	Poestenkill	17	.....	16	....	....	13	....	....	2	....	....	....
60	Sandlake	17	1	28	3	1	16	....	....	....	....	7	....
61	Schaghticoke (22)	25	1	16	3	....	7	....	....	1	....	1	....
23	*Schaghticoke, village*	10	.....	9	....	....	8	....	....	17	....	....	....
62	Schodack	29	2	38	2	....	24	4	....	3	....	1	....
24	*Castleton, village*	21	1	20	....	....	13	2	....	2	....	....	....
63	Stephentown	25	.....	23	3	....	17	....	....	6	....	....	....
43	ROCKLAND COUNTY	884	35	674	77	32	288	5	2	655	3	34	....
50	Clarkstown	101	2	89	7	7	40	....	....	126	1	17	....
20	*Upper Nyack, village*	15	1	11	2	....	7	....	....	14	....	....	....
51	Haverstraw	16	.....	7	3	....	3	....	....	2	....	....	....
21	*Haverstraw, village*	112	4	50	3	5	22	1	....	118	....	....	....
22	*West Haverstraw, village*	48	3	22	4	....	8	....	....	44	....	....	....
52	Orangetown	103	1	79	7	4	38	1	1	54	....	2	....
23	*Grand View-on-Hudson, village*	1	.....	1	....	....	....	....	....	....	....	....	....
24	*Nyack, village*	97	6	106	8	7	39	2	....	19	1	1	....
25	*Piermont, village*	28	.....	12	3	....	3	....	....	1	....	....	....
26	*South Nyack, village*	24	.....	32	1	1	16	....	....	4	....	2	....
53	Ramapo	97	6	108	17	1	48	....	....	55	1	8	....
27	*Hillburn, village*	27	1	17	4	2	7	....	....	8	....	....	....
28	*Spring Valley, village*	63	3	27	4	1	12	....	....	21	....	1	....
29	*Suffern, village*	95	7	48	10	....	24	....	1	80	....	1	....
54	Stony Point	52	1	40	3	3	21	1	....	71	....	1	....
10	Letchworth Village, Thiells	5	.....	18	1	1	....	....	....	38	....	1	....
11	New York State Hospital for Crippled and Deformed Children, West Haverstraw	.....	.....	7	....	....	....	....	....	....	....	....	....

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES: Whooping cough, 8 — Cases	Whooping cough, 8 — Deaths	Diphtheria, 9 — Cases	Diphtheria, 9 — Deaths	Influenza, 10 — Cases	Influenza, 10 — Deaths	Tuberculosis, 28-35: Pulmonary, 28-29 — Cases	Tuberculosis, 28-35: Pulmonary, 28-29 — Deaths	Tuberculosis, 28-35: Other forms, 30-35 — Cases	Tuberculosis, 28-35: Other forms, 30-35 — Deaths	Pneumonia, 91-92: Broncho, 91 — Cases	Pneumonia, 91-92: Broncho, 91 — Deaths	Pneumonia, 91-92: Lobar and unqualified, 92 — Cases	Pneumonia, 91-92: Lobar and unqualified, 92 — Deaths	Cancer, 39-45 — Deaths	Diarrhea and enteritis (under 2 years), 104 — Deaths	All other causes	District number
21		2			4		1					1	3	1	1	25	29
				9												8	72
1				110	2	2	1			2		5		3		27	73
51		11	1	406	5	23	13	2	2	28	8	18	5	8	5	123	39
19				19	1	5	3			4	3			2	2	32	50
														3		19	51
				10		1	3			2					2	14	52
7		1		104		6		2	1	6		4	2	1		11	53
		9	1	75	1	4	3			6	4	1	1		1	17	20
		1		48	3	1				3						7	21
				19					1	2	1			1		8	54
14				71		1	1			2		7	2	1		9	55
11				60		5	3			3		6				6	22
546	8	66	8	603	69	203	145	18	22	254	85	146	91	153	41	1,217	41
8		3		15	4	18	8			18	10	16	3	9	4	76	01
493	7	50	6	288	48	157	56	12	19	226	57	99	64	108	29	817	02
		1		55		4	3			3	2	2		1		8	50
40				7	1	3	1	2	1			2	2	4	1	26	51
						3	2	2				2	2	3		16	52
1		1				3	1			2	1	1	1	2		6	53
		1	1			1	1	1	1			1	3	5		15	54
	1	2			8	1	6				3		6	1	3	50	20
					1	1						1	4	2	1	20	55
		1			1						1	1				15	21
					1	2	60				1			3		11	56
2		2		24			1				1	5	2		1	15	57
2				106	3		1			1	1	4		1		21	58
		5	1	76		3	2			1		5		1		6	22
				30						2	1	1		3		12	59
						4	4	1	1		2		1		1	19	60
										1	3		1		1	11	61
				2							1	2		2		6	23
												1	1	5		32	62
					1	2						2	1			18	24
					1	1					1	1	1	3		17	63
191	1	104	9	422	20	91	54	11	9	53	18	89	36	45	18	459	43
12		16	1	88	2	13	5	1	1	8	2	19	4	7	1	65	50
												1	1			10	20
3		2		15		3				3		3		1	1	5	51
17		7	2	99		15	7	5	1	18	2	13	4	1	2	31	21
13		4	1	24	1	4	2			3	1	4	3	1		13	22
10		18	2	4	3	11	4			1	2	17	4	2	2	59	52
														1			23
9		20	3	5	5	12	4		1	4	1	9	7	7	1	76	24
		4		1						1	1	1		3	1	7	25
		4		3		3	1			1	2	5	2	1		26	26
1		14		10	3	11	21		1	4	3	4	4	9	5	61	53
					1	2			1	1			1	1	2	11	27
13				84	2	7	3	3		4	1	9		2		19	28
2		6		4	1	4		1		2	1		1	7	1	36	29
111	1	4		85	2	6	2	1	1	3		4	4	2	1	27	54
		5					2		1		2				1	12	10
							3		2				1			1	11

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Deaths, ages at death: Under 1	Deaths, ages at death: 1–4	Deaths, ages at death: 60 and over	Cause — Important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
44	**ST. LAWRENCE COUNTY**	1,967	106	1,507	239	53	710	86	7	345	2	237	12
01	**Ogdensburg, city**	327	16	308	62	15	116	2	2	9	....	97	4
50	Brasher	85	2	27	....	1	16	....	....	2	....	1	....
51	Canton	89	2	68	14	2	31	7	1	3	....	7	1
20	*Canton, village*	40	3	42	2	....	28	1	....	3	....	4	1
31	*Rensselaer Falls, village*	4	.....	3	....	....	2	....	....	.....	....	.....	....
52	Clare	4	.....	2	....	....	2	....	....	.....	....	.....	....
53	Clifton	30	2	13	6	1	1	....	....	.....	....	.....	....
54	Colton	20	1	22	....	....	15	....	....	2	....	3	....
55	De Kalb	47	5	31	5	1	11	....	1	1	....	2	....
21	*Richville, village*	2	.....	5	1	....	3	1	....	.....	....	.....	....
56	Depeyster	15	.....	6	....	1	4	....	....	15	....	.....	....
57	Edwards	27	1	10	3	....	5	3	....	.....	....	.....	....
22	*Edwards, village*	13	1	4	1	....	3	....	....	.....	....	.....	....
58	Fine	30	2	20	3	3	5	1	....	2	....	11	2
59	Fowler	36	3	15	2	....	5	....	....	2	....	2	....
60	Gouverneur	44	5	19	6	....	6	1	....	.....	....	4	....
23	*Gouverneur, village*	83	6	61	5	....	44	5	....	8	....	14	....
61	Hammond	31	.....	17	2	....	5	....	....	.....	....	15	1
24	*Hammond, village*	7	.....	1	....	....	1	....	....	.....	....	.....	....
62	Hermon	26	.....	6	1	....	3	....	....	.....	....	8	....
25	*Hermon, village*	10	.....	11	1	....	9	....	....	2	....	.....	....
63	Hopkinton	31	3	16	3	....	7	1	....	.....	....	4	....
64	Lawrence	31	4	21	3	2	14	1	....	.....	....	1	....
65	Lisbon	50	1	45	4	3	24	4	....	4	....	10	....
66	Louisville	23	2	22	1	....	14	....	....	16	....	.....	....
67	Macomb	12	1	6	1	....	4	....	....	.....	....	6	....
68	Madrid	35	3	29	4	....	19	....	....	8	....	.....	....
69	Massena	80	3	35	11	6	9	....	....	9	....	1	....
26	*Massena, village*	199	17	88	26	6	26	6	1	26	....	8	1
70	Morristown	27	2	16	6	1	8	....	....	.....	....	1	....
27	*Morristown, village*	12	1	5	....	....	4	....	....	.....	....	.....	....
71	Norfolk	72	2	37	5	6	16	....	....	79	....	15	1
28	*Norwood, village* (77)	35	2	23	8	....	11	1	....	93	1	1	....
72	Oswegatchie	21	.....	30	2	....	13	....	....	.....	....	.....	....
32	*Heuvelton, village*	6	.....	16	2	....	10	....	....	.....	....	1	....
73	Parishville	29	.....	27	3	....	15	....	....	.....	....	7	....
74	Piercefield	50	2	18	14	....	2	47	1	8	1	2	....
75	Pierrepont	88	1	22	4	1	10	2	....	1	....	.....	....
76	Pitcairn	20	1	3	....	....	3	....	....	.....	....	1	....
77	Potsdam (28)	71	2	50	11	....	22	....	....	37	....	5	....
29	*Potsdam, village*	78	5	60	4	2	37	....	1	4	....	5	1
78	Rossie	9	1	12	1	....	6	1	....	.....	....	.....	....
79	Russell	40	.....	17	5	....	8	....	....	.....	....	1	....
80	Stockholm	58	2	35	6	2	17	....	....	5	....	5	....
81	Waddington	13	2	12	1	....	6	1	....	6	....	.....	....
30	*Waddington, village*	7	.....	11	....	....	8	....	....	.....	....	.....	....
10	St. Lawrence State Hospital	.....	.....	160	....	....	82	1	....	.....	....	.....	....
45	**SARATOGA COUNTY**	1,193	59	916	92	49	444	47	6	393	1	170	20
01	**Saratoga Springs, city**	273	21	251	22	7	132	4	1	28	....	1	....
02	**Mechanicville, city**	194	10	107	12	21	36	34	1	64	....	129	18
50	Ballston	24	1	16	....	....	11	....	....	17	....	2	....
20	*Ballston Spa, village* (61)	71	3	66	10	....	38	1	....	55	....	2	....
51	Charlton	18	.....	13	4	....	6	1	1	12	....	.....	....
52	Clifton Park	30	1	21	....	....	15	....	....	5	....	.....	....
53	Corinth	26	2	7	2	....	1	....	....	.....	....	.....	....

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES										Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Broncho, 91		Lobar and unqualified, 92					
						Pulmonary, 28-29		Other forms, 30-35									
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
209	9	53	7	1,457	77	109	69	10	12	194	60	171	73	74	56	1,049	44
1		25	4	7	14	10	5	1	2	51	13	26	3	16	14	221	01
7		2		69	4	7	1		1			6	1	3		17	50
				1	2	3	1		1	1	4	1	3	3	5	47	51
					2	5	2			1	1	1	2	4	1	29	20
																3	31
																2	52
2	2	1		2		1	1			4			1		3	6	53
				60	2					2		4	1			19	54
				1	3		2					1			1	24	55
						1						1		1	1	3	21
	1					1										5	56
						1				1		4	2		2	6	57
						1						1				4	22
4						3	3					2	1		1	13	58
				9		1	1			2	1	3	1		1	11	59
1					1						2		1	1	1	13	60
2		1		7	1	3	2				2	2	1	9		46	23
					1						1			1		13	61
																1	24
					1	2	1									4	62
					1									1		9	25
8		1		37	2	1		1		3		1	1	2		11	63
24				64	2	2				4		3	2			17	64
				60	5	3	2	1	2	8	1	9	2	3		30	65
1						5	1			3	2	14	5	2		12	66
	1	1				2								2		3	67
10	1	5		1	2	2	2			7		8	2			22	68
25	1	2	1		1	5				6	3	4			2	27	69
29	2	8	1	1	4	11	2			22	7	19	9	1	7	53	26
		1			1		1	2					1	2	2	9	70
18																5	27
12				78		8	5	1	1	5	4	19	3	2	5	16	71
4				120		6	2	2	1	2	1	4		1	3	14	28
					3		3		1				4	2		17	72
					1						2		1			12	32
8				40	4	1	1	1	1	11	2	8	1		1	17	73
3		1			2	1				5					2	12	74
				29	2		1					1	1			18	75
						3				1		1		1		2	76
10				18	6	7	2		1	14	3	7	3	4	3	28	77
29				763	7	7	2	1	1	28		10	1	3		44	29
														1		11	78
5						1				1	1	1	1	1	1	13	79
6	1		1	39	2	3	4			2	1	7		3		23	80
		5				2				5	2	2	2	1		7	81
										1	2			1		8	30
				51	1		22			4	5	1	7	3		122	10
227	7	46	1	1,986	33	137	65	8	6	155	33	142	62	59	14	609	45
28	1	9	1	871	5	48	14	2	2	59	8	57	21	11		187	01
40		5		49	3	20	1	1	2	28	5	10	4	8	2	63	02
4		2		21		1		1		1		1		3		13	50
33	2			12	2	5	5	1		6	2	6	3	9		43	20
				53	1	2				1		3	2		1	8	51
				8		1	1			1	1		1	2		16	52
				28	2	2				2		1				5	53

Table 17 — New York State (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Ages at death: Under 1	Ages at death: 1–4	Ages at death: 60 and over	Causes — Important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	Saratoga Co. — (*Concluded*)												
21	*Corinth, village*	45	3	27	3	....	11	....	....	......	....	1	....
54	Day	14	.....	9	....	....	6	....	....	......	....	......	....
55	Edinburg	9	.....	9	....	....	5	1	1	2	....	4	....
56	Galway	21	1	7	....	1	3	....	....	4	....	2	....
22	*Galway, village*	3	.....	3	....	....	1	....	....	......	....	......	....
57	Greenfield	27	.....	15	1	1	9	....	....	10	....	......	....
58	Hadley	18	1	10	3	1	4	....	....	......	....	......	....
59	Halfmoon	23	2	17	....	....	8	....	....	3	....	3	....
60	Malta	12	.....	26	2	1	18	....	....	9	....	1	....
61	Milton (20)	24	.....	35	1	....	27	....	....	29	....	......	....
62	Moreau	25	.....	26	3	....	6	1	....	......	....	......	....
24	*South Glens Falls, village*	43	.....	28	1	1	14	2	1	1	....	......	....
63	Northumberland	16	.....	12	....	....	8	....	....	7	....	......	....
64	Providence	7	.....	22	2	....	3	....	....	1	....	......	....
65	Saratoga	23	.....	14	1	....	10	....	....	13	....	......	....
25	*Schuylerville, village*	26	1	19	1	1	10	....	....	32	....	......	....
26	*Victory Mills, village*	9	.....	11	1	2	1	....	....	2	....	1	....
66	Saratoga Springs*	.....	.....	.....	....	....	....	....	....	......	....	......	....
67	Stillwater (23)	83	3	33	6	6	10	1	....	6	....	22	2
27	*Stillwater, village*	9	.....	15	3	1	9	....	....	......	....	2	....
68	Waterford	40	3	26	4	2	9	1	....	34	1	......	....
28	*Waterford, village*	70	6	59	9	4	26	1	1	59	....	......	....
69	Wilton	10	1	12	1	....	7	....	....	......	....	......	....
46	**Schenectady County**	2,332	78	1,199	193	58	420	106	8	1,470	10	110	2
01	**Schenectady, city**	1,968	69	956	168	51	323	90	7	1,254	9	84	2
50	Duanesburg	35	2	28	2	....	24	1	....	23	....	3	....
51	Glenville	41	2	62	1	1	19	5	....	18	....	12	....
20	*Scotia, village*	65	1	34	3	2	15	3	1	31	1	2	....
52	Niskayuna	51	1	29	1	....	19	2	....	21	....	6	....
53	Princetown	6	.....	3	1	....	1	....	....	3	....	......	....
54	Rotterdam	166	3	77	17	4	21	5	....	120	....	3	....
47	**Schoharie County**	377	19	350	26	5	232	8	1	90	....	47	....
50	Blenheim	12	.....	9	....	....	6	....	....	......	....	......	....
51	Broome	17	1	14	....	....	10	....	....	1	....	......	....
52	Carlisle	13	1	17	2	....	12	....	....	7	....	......	....
53	Cobleskill	44	3	31	2	....	25	....	....	5	....	......	....
20	*Cobleskill, village*	35	1	12	1	....	8	....	....	22	....	3	....
54	Conesville	13	.....	15	....	2	9	....	....	7	....	......	....
55	Esperance	13	.....	12	....	....	9	....	....	......	....	......	....
21	*Esperance, village*	3	.....	.....	....	....	....	1	....	1	....	4	....
56	Fulton	16	2	21	1	1	13	1	....	1	....	......	....
57	Gilboa	29	2	25	3	....	14	....	....	21	....	1	....
58	Jefferson	17	1	22	....	....	18	....	....	18	....	......	....
59	Middleburg	14	.....	14	1	....	9	....	....	......	....	......	....
22	*Middleburg, village*	8	.....	17	1	....	12	3	1	......	....	......	....
60	Richmondville	18	1	11	2	....	4	....	....	......	....	15	....
23	*Richmondville, village*	9	.....	14	1	....	11	....	....	......	....	2	....
61	Schoharie	35	1	23	3	....	15	1	....	......	....	......	....
24	*Schoharie, village*	7	.....	16	1	1	8	2	....	......	....	......	....
62	Seward	19	2	20	4	1	9	....	....	6	....	......	....
63	Sharon	26	.....	14	1	....	11	....	....	1	....	5	....
25	*Sharon Springs, village*	3	.....	8	....	....	4	....	....	......	....	......	....
64	Summit	13	4	15	2	....	9	....	....	......	....	17	....
65	Wright	13	.....	20	1	....	16	....	....	......	....	......	....

* Included in city of

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8: Cases	Whooping cough, 8: Deaths	Diphtheria, 9: Cases	Diphtheria, 9: Deaths	Influenza, 10: Cases	Influenza, 10: Deaths	Tuberculosis, 28-35: Pulmonary, 28-29: Cases	Tuberculosis, 28-35: Pulmonary, 28-29: Deaths	Tuberculosis, 28-35: Other forms, 30-35: Cases	Tuberculosis, 28-35: Other forms, 30-35: Deaths	Pneumonia, 91-92: Broncho, 91: Cases	Pneumonia, 91-92: Broncho, 91: Deaths	Pneumonia, 91-92: Lobar and unqualified, 92: Cases	Pneumonia, 91-92: Lobar and unqualified, 92: Deaths	Cancer, 39-45: Deaths	Diarrhea and enteritis (under 2 years), 104: Deaths	All other causes	District number
....	....	....	....	*262*	*4*	*4*	*1*	....	....	*9*	....	*7*	*2*	*2*	*2*	*16*	*21*
....	....	....	....	1	1	....	....	....	....	....	....	....	....	1	....	7	54
....	....	....	....	7	1	5	1	....	....	1	....	....	....	....	....	6	55
1	....	....	....	62	2	1	....	....	....	2	....	2	1	....	....	4	56
....	....	....	....	*11*	....	....	1	....	....	*1*	....	*1*	*1*	....	....	*1*	*22*
....	....	....	....	23	....	5	1	....	....	2	....	11	1	2	....	11	57
....	....	....	....	....	....	3	....	....	....	1	....	....	1	....	....	9	58
2	....	....	....	21	1	....	2	1	1	....	....	2	1	2	....	10	59
....	....	....	....	100	....	3	1	....	....	5	1	3	....	2	2	20	60
8	....	1	....	55	1	2	....	....	....	1	2	2	4	2	....	26	61
....	....	1	....	1	1	1	8	....	....	1	....	....	1	2	1	13	62
2	....	*2*	....	*33*	....	7	*1*	....	....	*3*	*3*	*3*	*2*	*2*	....	*19*	*24*
1	....	1	....	....	....	1	....	....	....	....	....	....	1	2	....	9	63
....	....	....	....	31	2	....	16	....	....	2	....	1	....	....	1	3	64
3	....	8	....	5	1	....	1	1	....	1	2	3	2	....	1	7	65
....	....	*7*	....	*6*	*2*	*3*	....	....	*1*	*2*	....	*1*	*2*	*1*	*1*	*12*	*25*
....	....	*4*	....	....	....	*1*	*1*	....	....	....	*1*	....	....	*1*	....	*8*	*26*
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	66
21	1	....	....	47	2	5	2	....	....	9	2	3	4	....	....	20	67
4	....	....	....	*24*	....	*3*	*1*	....	....	*10*	*4*	*3*	....	*2*	....	*8*	*27*
7	1	1	....	4	1	3	4	1	....	....	....	2	2	1	1	15	68
68	*2*	*5*	....	*248*	*1*	*10*	*2*	....	....	*7*	*2*	*17*	*3*	*3*	*2*	*45*	*28*
5	....	....	....	3	....	1	1	....	....	....	....	3	3	1	....	7	69
363	5	125	7	259	53	151	85	22	7	160	59	97	32	81	56	794	46
265	5	116	7	244	46	131	53	16	5	142	50	87	24	61	47	640	01
11	....	....	....	....	3	1	1	1	1	3	....	....	1	5	....	27	50
13	....	3	....	12	1	3	20	1	....	3	2	1	1	1	....	37	51
12	....	*1*	....	*1*	*1*	*3*	*2*	*1*	....	*4*	*1*	*2*	....	*3*	....	*25*	*20*
8	....	1	....	2	....	2	4	....	....	1	....	3	3	4	1	17	52
1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	53
53	....	4	....	....	2	11	5	3	1	7	6	4	3	6	7	47	54
55	....	2	....	572	12	22	11	2	1	31	8	16	6	28	3	280	47
....	....	....	....	28	2	2	1	....	1	4	....	....	....	....	....	5	50
....	....	....	....	2	....	....	1	....	....	....	1	....	....	....	....	12	51
....	....	....	....	4	1	....	....	....	....	2	....	1	1	1	....	14	52
3	....	....	....	38	3	2	....	....	....	2	1	1	....	2	....	25	53
12	....	*2*	....	*130*	....	....	*1*	....	....	*6*	....	*2*	....	*3*	....	*8*	*20*
....	....	....	....	....	1	....	....	....	....	....	1	....	1	....	....	12	54
10	....	....	....	15	....	....	....	....	....	....	....	....	....	1	....	11	55
7	....	....	....	*13*	....	*2*	....	....	....	....	....	....	....	....	....	....	*21*
7	....	....	....	....	1	2	....	....	....	3	....	3	....	....	....	20	56
6	....	....	....	15	1	3	2	....	....	1	1	....	1	2	....	18	57
....	....	....	....	32	....	3	....	1	....	2	1	2	2	....	....	19	58
....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	12	59
....	....	....	....	....	....	*1*	....	....	....	*1*	....	*1*	....	*1*	....	15	*22*
....	....	....	....	46	1	2	1	....	....	2	....	....	....	1	....	8	60
....	....	....	....	*39*	*1*	....	....	....	....	*1*	*1*	....	....	....	....	*12*	*23*
2	....	....	....	7	1	....	....	1	....	2	1	....	....	1	....	20	61
2	....	....	....	....	....	....	*1*	....	....	....	....	....	....	*1*	*1*	*13*	24
1	....	....	....	17	....	....	1	....	....	2	1	....	....	3	1	14	62
....	....	....	....	....	....	2	....	....	....	....	....	1	....	2	....	12	63
....	....	....	....	*2*	....	....	....	....	....	....	....	*1*	....	*1*	....	7	*25*
....	....	....	....	184	....	3	1	....	....	3	....	4	1	3	1	9	64
5	....	....	....	....	....	....	1	....	....	....	....	....	....	5	....	14	65

Saratoga Springs.

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS		DEATHS	AGES AT DEATH			CAUSE — IMPORTANT					
								Typhoid fever, 1		Measles, 6		Scarlet fever, 7	
		Living births	Stillbirths	Total deaths at all ages	Under 1	1-4	60 and over	Cases	Deaths	Cases	Deaths	Cases	Deaths
48	SCHUYLER COUNTY	256	7	232	14	4	157	1		269	1	17	
50	Catharine	13	1	10			6			3		1	
20	*Odessa, village*	4		7			7			7		2	
51	Cayuta	7		3			1			1			
52	Dix	8		11			8			16		2	
21	*Watkins, village (56)*	61	4	58	4	1	39	1		115		2	
53	Hector	47	1	51	2	2	35			42	1	5	
22	*Burdett, village*	7		9	1		8			24			
54	Montour	4		3			3						
23	*Montour Falls, village*	46		28	5		11			4		4	
55	Orange	12	1	17	1		14			2			
56	Reading (21)	17		15			9			46			
57	Tyrone	30		22	1	1	16			9		1	
49	SENECA COUNTY	415	15	638	34	11	369	113	8	98		18	2
50	Covert	15	1	16	2		14			11			
20	*Interlaken, village*	4		15	1	1	10					1	
51	Fayette	34	2	28	3	1	18	1		11		2	
21	*Waterloo, village (59)*	64	3	71	7	2	45	3	1	1		1	1
52	Junius	14		12	3		5					6	
53	Lodi	17	1	11	1		9			8		1	
54	Ovid	18		14		1	8			3		1	
22	*Ovid, village*	7		3			1						
55	Romulus	36	1	19	4		13			33			
56	Seneca Falls	6		5			4			1			
23	*Seneca Falls, village*	150	6	125	10	5	75	106	6	7		3	1
57	Tyre	12		5	1		2					3	
58	Varick	26	1	11	1		5			21			
59	Waterloo (21)	11		13		1	9	2		2			
10	Willard State Hospital	1		290	1		151	1	1				
50	STEUBEN COUNTY	1,682	66	1,437	110	35	867	17	2	254		67	1
01	**Corning, city**	427	13	242	27	7	109	1		9			
02	**Hornell, city**	295	9	221	18	6	106	3		107		14	
50	Addison	8		2			2	1		1			
20	*Addison, village*	31	2	32			24	1		2		2	
51	Avoca	19		12	2		9			15			
21	*Avoca, village*	11	2	14			8			8			
52	Bath	40	2	56	5		31	2				1	
22	*Bath, village*	79	7	100	9	1	51	1		6			
23	*Savona, village*	8		9			6						
53	Bradford	10		13			11			4		5	
54	Cameron	15	1	12		1	7					4	
55	Campbell	15		19	1		9	1		1			
56	Canisteo	10	2	11	3		5					3	
24	*Canisteo, village*	41	1	38	3	3	27					4	
57	Caton	19		11	1		8			4			
58	Cohocton	35	3	27		1	14			14		1	
25	*Cohocton, village*	16		14		1	12			19			
59	Corning	60		34	6	2	15		1				
60	Dansville	17	2	16	2		11						
61	Erwin	18	1	13	2		5						
26	*Painted Post, village*	46	5	27	4	2	15	1				4	
62	Fremont	15		2			2			3			
63	Greenwood	14	1	11	1		7						
64	Hartsville	10		4		1	2					1	
65	Hornby	17		6			5						

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8: Cases	Whooping cough, 8: Deaths	Diphtheria, 9: Cases	Diphtheria, 9: Deaths	Influenza, 10: Cases	Influenza, 10: Deaths	Tuberculosis, 28-35: Pulmonary, 28-29: Cases	Tuberculosis, 28-35: Pulmonary, 28-29: Deaths	Tuberculosis, 28-35: Other forms, 30-35: Cases	Tuberculosis, 28-35: Other forms, 30-35: Deaths	Pneumonia, 91-92: Broncho, 91: Cases	Pneumonia, 91-92: Broncho, 91: Deaths	Pneumonia, 91-92: Lobar and unqualified, 92: Cases	Pneumonia, 91-92: Lobar and unqualified, 92: Deaths	Cancer, 39-45: Deaths	Diarrhea and enteritis (under 2 years), 104: Deaths	All Other causes	District number
23	.....	.....	.....	28	5	20	9	2	1	5	3	15	5	17	....	191	48
7	.....	.....	.....	.....	...	1	.....	.....	.....	....	1	....	1	....	....	9	50
3	.....	.....	.....	.....	...	2	.....	.....	.....	....	....	....	...	....	....	7	20
....	.....	.....	.....	.....	...	.....	.....	.....	.....	....	....	....	...	1	....	2	51
....	.....	.....	.....	2	1	1	.....	.....	.....	....	....	....	1	....	....	9	52
6	.....	.....	.....	15	1	7	4	2	.....	1	....	3	...	7	....	46	21
....	.....	.....	.....	.....	...	1	1	.....	.....	2	1	7	...	4	....	44	53
....	.....	.....	.....	.....	...	.....	.....	.....	.....	....	....	....	...	....	....	9	22
....	.....	.....	.....	.....	...	.....	.....	.....	.....	....	....	....	...	....	....	3	54
....	.....	.....	.....	4	3	4	2	.....	1	1	....	1	1	2	....	17	23
....	.....	.....	.....	.....	...	.....	1	.....	.....	....	....	3	2	....	....	14	55
....	.....	.....	.....	.....	...	4	1	.....	.....	1	....	1	...	....	....	14	56
7	.....	.....	.....	7	...	.....	.....	.....	.....	....	1	....	1	3	....	17	57
83	1	70	1	554	7	24	66	2	7	77	33	67	34	32	6	441	49
1	.....	.....	.....	1	...	2	.....	.....	.....	1	1	3	...	2	....	13	50
....	.....	.....	.....	.....	...	3	.....	.....	.....	....	....	....	...	1	1	13	20
16	.....	.....	.....	35	...	1	3	.....	.....	2	1	7	2	....	....	22	51
7	.....	1	.....	31	1	5	.....	.....	.....	....	....	3	5	2	2	59	21
....	.....	1	.....	13	...	.....	1	.....	.....	1	1	2	2	1	1	6	52
4	.....	.....	.....	76	...	1	.....	.....	.....	1	....	....	...	2	....	9	53
....	.....	2	.....	17	1	1	.....	.....	.....	10	....	5	2	2	....	9	54
....	.....	.....	.....	25	...	.....	.....	.....	.....	....	....	....	...	1	....	2	22
....	.....	.....	.....	157	...	1	1	.....	.....	14	....	6	1	1	1	15	55
2	.....	2	.....	9	...	1	.....	.....	.....	....	....	....	...	....	....	5	56
42	1	55	1	108	1	8	6	2	2	16	5	22	6	14	1	81	23
....	.....	1	.....	.....	...	.....	.....	.....	.....	....	....	....	...	1	....	4	57
....	.....	1	.....	72	2	1	.....	.....	.....	3	1	4	...	1	....	7	58
11	.....	1	.....	8	2	.....	.....	.....	.....	1	1	2	1	1	....	8	59
....	.....	6	.....	2	...	.....	55	.....	5	28	23	13	15	8	....	188	10
131	4	35	3	1,102	50	96	53	9	5	81	45	102	52	116	18	1,088	50
6	1	6	1	5	15	21	13	.....	1	15	9	27	16	14	1	171	01
38	.....	18	1	329	9	38	12	4	1	35	8	25	5	22	1	162	02
....	.....	.....	.....	.....	...	.....	.....	.....	.....	....	....	1	...	....	....	2	50
....	.....	.....	.....	4	...	2	.....	.....	.....	....	....	3	...	2	....	30	20
....	.....	.....	.....	1	...	.....	.....	.....	.....	1	....	....	...	1	....	11	51
8	.....	.....	.....	9	1	.....	.....	1	.....	....	....	1	1	1	....	11	21
13	.....	.....	.....	96	3	4	10	1	.....	....	1	2	...	2	1	39	52
....	.....	2	.....	130	1	1	4	1	1	1	5	7	2	12	3	72	22
....	.....	.....	.....	8	...	1	1	.....	.....	....	....	....	...	4	....	4	23
....	.....	.....	.....	.....	...	.....	.....	.....	.....	....	1	1	...	1	....	11	53
....	.....	.....	.....	.....	...	1	.....	.....	.....	2	....	1	2	1	....	9	54
....	.....	.....	.....	.....	...	2	.....	.....	.....	....	....	....	...	5	....	14	55
2	.....	.....	.....	.....	...	.....	.....	.....	.....	1	1	2	1	1	1	7	56
4	1	1	.....	.....	1	1	1	.....	.....	....	5	....	2	4	....	24	24
....	.....	.....	.....	.....	...	1	.....	.....	.....	....	....	5	2	1	....	8	57
....	.....	1	.....	.....	3	2	.....	.....	.....	6	....	2	2	2	....	20	58
....	.....	1	1	.....	...	.....	.....	.....	.....	2	....	3	...	....	....	13	25
....	.....	1	.....	.....	...	3	2	.....	.....	....	1	2	2	3	4	21	59
....	.....	.....	.....	77	2	.....	.....	.....	.....	1	....	2	2	4	....	8	60
1	.....	.....	.....	4	...	.....	.....	.....	.....	....	1	....	2	1	....	9	61
1	.....	2	.....	28	1	3	3	.....	1	4	2	5	...	2	....	18	26
1	.....	.....	.....	17	1	.....	.....	.....	.....	....	....	1	...	....	....	1	62
1	.....	.....	.....	.....	...	1	1	.....	.....	....	1	....	...	2	....	7	63
....	.....	.....	.....	.....	...	.....	.....	.....	1	1	....	....	...	....	....	3	64
....	.....	.....	.....	.....	...	.....	.....	.....	.....	....	....	....	...	1	....	5	65

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births		Deaths				Cause					
				Ages at death				Important					
								Typhoid fever, 1		Measles, 6		Scarlet fever, 7	
		Living births	Stillbirths	Total deaths at all ages	Under 1	1–4	60 and over	Cases	Deaths	Cases	Deaths	Cases	Deaths
	STEUBEN CO. — (*Concluded*)												
66	Hornellsville	67	5	57	7	2	27	1	1	...	...	1	...
31	*Arkport, village*	9	...	3	...	...	2	...	...	...	...	1	...
67	Howard	15	...	12	...	1	5	...	...	38	...	1	1
68	Jasper	26	1	14	1	1	11	...	...	...	...	3	...
69	Lindley	28	...	9	...	...	8	...	...	...	...	...	...
70	Prattsburg	11	...	20	...	1	14	...	...	...	...	1	...
27	*Prattsburg, village*	8	...	20	...	...	15	...	...	...	...	1	...
71	Pulteney	18	...	24	2	1	14	1	...	2	...	...	...
72	Rathbone	14	...	12	2	1	7	...	...	...	...	2	...
73	Thurston	20	1	8	...	2	5	...	...	...	...	...	...
74	Troupsburg	34	1	17	2	...	11	2	...	...	...	...	...
75	Tuscarora	14	1	9	2	1	6	...	...	...	...	...	...
76	Urbana	14	...	11	...	...	6	1	...	2	...	4	...
28	*Hammondsport, village*	8	...	10	3	...	5	...	...	7	...	...	...
77	Wayland	26	...	16	2	...	9	...	...	11	...	1	...
29	*Wayland, village*	26	2	35	2	...	23	...	...	1	...	1	...
78	Wayne	11	1	8	1	...	4	1	...	...	...	...	...
79	West Union	16	2	8	...	...	6	...	...	...	...	...	...
80	Wheeler	15	...	11	1	...	7	...	...	...	...	12	...
81	Woodhull	18	3	13	1	...	12	...	...	...	...	...	...
30	*Woodhull, village*	8	...	6	...	...	6	...	...	...	...	...	...
10	New York State Soldiers' and Sailors' Home, Bath	...	...	168	...	...	166	...	...	...	...	...	...
51	SUFFOLK COUNTY	2,143	76	2,241	164	54	903	35	9	377	5	146	6
50	Babylon	105	4	85	9	2	44	3	...	1	1	...	...
20	*Amityville, village*	56	...	90	3	3	54	5	1	...	1	...	...
21	*Babylon, village*	70	1	48	5	...	24	6	3	4	...	...	...
51	Brookhaven	319	15	266	27	11	123	7	1	21	2	46	3
22	*Bellport, village*	1	...	9	1	...	5	...	...	...	...	...	1
23	*Patchogue, village*	82	5	55	5	4	26	...	...	...	...	41	2
28	*Shoreham, village*	...	...	...	...	...	...	...	...	...	...	...	...
52	Easthampton	69	4	40	10	3	15	...	1	14	...	...	...
24	*Sag Harbor, village (58)*	56	1	36	5	1	20	...	...	2	...	3	...
53	Huntington	315	12	161	21	6	76	6	...	61	1	10	...
25	*Northport, village*	27	1	23	1	...	15	1	1	6	...	3	...
54	Islip	316	7	173	25	7	78	2	...	101	...	11	...
29	*Brightwaters, village*	6	...	7	...	...	3	...	...	...	...	...	...
55	Riverhead	122	5	46	12	1	20	...	1	50	...	5	...
56	Shelter Island	20	...	19	1	1	10	...	...	...	...	...	...
57	Smithtown	63	1	43	4	1	24	1	...	10	...	2	...
58	Southampton (24)	149	4	78	6	5	37	...	...	68	...	3	...
26	*Southampton, village*	109	2	77	13	3	23	...	...	31	...	15	...
59	Southold	157	8	77	12	1	39	...	...	7	...	1	...
27	*Greenport, village*	93	6	55	4	5	25	1	...	...	...	6	...
10	Central Islip State Hospital	4	...	559	...	...	154	1	1	...	...	...	...
11	Kings Park State Hospital	4	...	294	...	...	88	2	...	1	...	...	...
52	SULLIVAN COUNTY	539	18	625	31	14	225	16	2	201	1	49	...
50	Bethel	42	1	34	9	...	15	...	...	22	1	4	...
51	Callicoon	22	1	25	...	...	13	1	...	16	...	6	...
52	Cochecton	15	2	14	...	...	8	...	...	5	...	1	...
53	Delaware	22	1	23	2	...	14	1	1	40	...	...	...
54	Fallsburgh	72	5	47	4	3	19	2	...	59	...	15	...

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
						Pulmonary, 28-29		Other forms, 30-35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
		1		13	2	1				2	1	1	2	3		48	66
				43						*1*		*1*				*3*	*31*
				3	1	1	1						1	1		7	67
9						1					1	1			1	12	68
				6		1						1		1		8	69
					2	3					1			2		15	70
				1		*1*	*1*				*1*			*4*		*14*	*27*
10	1			13		3		1		1			2		1	20	71
	1					1				1		1	2	1	1	7	72
							1				1				1	5	73
					1							2	1	1		14	74
		1		3												9	75
1				10			2					2	1			8	76
				34								*2*		*1*	*1*	*8*	*28*
2				97	1					2	1			1		13	77
34		*1*		*165*	*2*			*1*		*4*	*4*			*5*	*1*	*23*	*29*
				6	3								1			4	78
														1		7	79
						1				1				1	1	9	80
																13	81
					1	*2*						*1*	*1*			*4*	*30*
							1						2	8		157	10
151	7	168	6	2,505	53	99	231	12	11	194	63	145	83	120	29	1,618	51
	2	1	1		8		6		1	3	1	2	6	4	1	54	50
					2		*2*						*2*	*3*		*79*	*20*
2				*51*		*6*	*1*			*3*	*1*	*1*	*2*	*6*		*35*	*21*
21	2	31	3	163	2	18	31	3	8	12	12	14	8	16	5	178	51
																8	*22*
7		*14*		*67*	*1*	*6*				*4*	*3*	*4*	*4*	*4*	*1*	*40*	*23*
												1					*28*
6		14		2	1	1				3	2	8		5	3	28	52
8		*7*			*2*	*5*	*2*			*11*	*1*	*1*	*2*	*1*	*2*	*26*	*24*
2	3	9		352	1	14	9	2		11	3	16	7	20	5	112	53
		2		*32*	*1*					*3*		*1*	*1*	*3*	*1*	*16*	*25*
38		32		966	7	16	7	1	4	27	2	35	7	18	1	127	54
				6										*1*		*6*	*29*
6		6		122	1	5	3			3	1	3	1	3	1	35	55
				173			1						2	1		15	56
35		4		35	1	9	3			12	2	2	2	2	1	32	57
12		8	1	9	5	5	3	1		8	3	3	4	2	3	57	58
14		*13*	*1*	*5*	*2*	*6*				*7*	*2*	*6*	*6*	*4*	*3*	*59*	*26*
		8		9	6	5	2	4	1	11	4	9	6	5	2	51	59
		3			*2*	*3*	*2*	*1*			*1*	*5*	*2*	*5*		*43*	*27*
		16		169	6		95			19	7	17	12	9		429	10
				344	5		64		2	57	18	17	9	8		188	11
85		65	6	249	11	858	208	81	7	53	13	37	19	31	4	323	52
3		5		84	1	3	2	1	3	3	2			3	1	21	50
10		1		8		16	3	1				1	1	3		18	51
				2		8	1	1				1	1			12	52
3						7	2			2	1	2			1	18	53
16		8		27	5	72	6	4		30	5	9	1	6		24	54

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS		DEATHS				CAUSES					
					AGES AT DEATH			IMPORTANT					
								Typhoid fever, 1		Measles, 6		Scarlet fever, 7	
		Living births	Stillbirths	Total deaths at all ages	Under 1	1–4	60 and over	Cases	Deaths	Cases	Deaths	Cases	Deaths
	SULLIVAN CO. — (*Concluded*)												
23	*Woodridge, village*	*11*	*1*	*1*	....	*1*	....	....	....	....	....	*5*	....
55	Forestburg	8	....	5	....	....	1	....	....	....	....	....	....
56	Fremont	25	....	16	1	1	9	....	....	2	....	2	....
57	Highland	13	1	24	1	....	13	1	....	1	....	....	....
58	Liberty	83	2	97	3	2	19	1	....	7	....	3	....
20	*Liberty, village*	*25*	....	*117*	....	*1*	*18*	....	....	*13*	....	....	....
59	Lumberland	7	....	7	1	1	2	....	....	....	....	....	....
60	Mamakating	25	....	25	2	....	11	....	....	3	....	2	....
21	*Wurtsboro, village*	*4*	*1*	*10*	....	....	*5*	....	....	....	....	....	....
61	Neversink	23	1	27	1	2	12	....	....	1	....	....	....
62	Rockland	59	1	43	4	....	20	8	1	16	....	1	....
63	Thompson	36	....	48	1	1	23	1	....	12	....	3	....
22	*Monticello, village*	*35*	....	*54*	*2*	*2*	*17*	*1*	....	*4*	....	*1*	....
64	Tusten	12	1	8	....	....	6	....	....	....	....	6	....
53	TIOGA COUNTY	416	11	394	37	7	250	26	3	58	....	26	1
50	Barton	29	1	20	2	....	13	....	....	....	....	....	....
20	*Waverly, village*	*73*	*1*	*64*	*8*	*1*	*41*	*1*	*1*	*2*	....	*6*	....
51	Berkshire	14	....	13	1	....	9	....	....	1	....	2	....
52	Candor	32	....	36	2	1	27	....	....	....	....	1	....
21	*Candor, village*	*12*	*2*	*14*	*2*	....	*9*	....	....	....	....	*1*	....
53	Newark Valley	19	1	16	....	....	9	....	....	4	....	6	....
22	*Newark Valley, village*	*13*	....	*12*	*1*	*1*	*9*	....	....	*2*	....	*1*	....
54	Nichols	22	1	14	1	1	9	2	....	8	....	1	....
23	*Nichols, village*	*15*	....	*9*	....	....	*6*	*3*	....	*1*	....	*1*	....
55	Owego	62	1	47	6	1	28	....	....	34	....	4	....
24	*Owego, village*	*55*	*2*	*81*	*5*	....	*50*	*18*	*2*	*5*	....	*2*	1
56	Richford	16	....	7	3	....	3	....	....	1	....	1	....
57	Spencer	21	2	9	2	....	5	....	....	4	....	....	....
25	*Spencer, village*	*6*	....	*16*	*1*	*1*	*9*	....	....	....	....	....	....
58	Tioga	27	....	36	3	1	23	2	....	1	....	....	....
54	TOMPKINS COUNTY	684	20	531	53	15	319	10	1	57	....	56	....
01	**Ithaca, city**	350	12	274	33	11	142	9	1	36	....	36	....
50	Caroline	36	....	17	3	....	9	....	....	1	....	1	....
51	Danby	36	....	15	1	1	13	....	....	....	....	2	....
52	Dryden	36	....	28	....	1	20	....	....	8	....	2	....
20	*Dryden, village*	*8*	....	*13*	*1*	....	*11*	....	....	....	....	....	....
21	*Freeville, village*	*6*	*1*	*2*	....	....	*1*	....	....	....	....	....	....
53	Enfield	14	1	7	1	....	5	....	....	....	....	....	....
54	Groton	38	3	25	1	....	16	....	....	....	....	4	....
22	*Groton, village*	*41*	*2*	*29*	*2*	....	*19*	....	....	....	....	....	....
55	Ithaca	31	....	16	3	....	9	....	....	4	....	....	....
25	*Cayuga Heights, village*	....	....	*1*	....	....	*1*	....	....	....	....	....	....
56	Lansing	37	1	29	5	....	18	....	....	....	....	2	....
57	Newfield	22	....	17	2	2	10	1	....	....	....	....	....
23	*Newfield, village*	*5*	....	*3*	....	....	*3*	....	....	....	....	....	....
58	Ulysses	11	....	36	....	....	26	....	....	4	....	8	....
24	*Trumansburg, village*	*13*	....	*19*	*1*	....	*16*	....	....	*9*	....	*6*	....
55	ULSTER COUNTY	1,282	51	1,236	110	52	601	36	8	1,145	7	119	2
01	**Kingston, city**	496	20	450	40	18	201	12	3	683	1	19	....
50	Denning	7	1	7	1	1	1	....	....	....	....	....	....
51	Esopus	53	5	56	3	8	27	2	....	55	2	....	....
20	*Rifton, village*	*2*	....	....	....	....	....	....	....	....	....	....	....
52	Gardiner	17	....	9	....	2	3	....	....	11	....	5	....
53	Hardenburg	7	....	4	....	....	3	....	....	....	....	....	....

showing registration district numbers, birth, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES: Whooping-cough, 8 — Cases	Whooping-cough, 8 — Deaths	Diphtheria, 9 — Cases	Diphtheria, 9 — Deaths	Influenza, 10 — Cases	Influenza, 10 — Deaths	Tuberculosis, 28-35: Pulmonary, 28-29 — Cases	Tuberculosis, 28-35: Pulmonary, 28-29 — Deaths	Tuberculosis, 28-35: Other forms, 30-35 — Cases	Tuberculosis, 28-35: Other forms, 30-35 — Deaths	Pneumonia, 91-92: Broncho, 91 — Cases	Pneumonia, 91-92: Broncho, 91 — Deaths	Pneumonia, 91-92: Lobar and unqualified, 92 — Cases	Pneumonia, 91-92: Lobar and unqualified, 92 — Deaths	Cancer, 39-45 — Deaths	Diarrhea and enteritis (under 2 years), 104 — Deaths	All other causes	District number
8	....	*5*	....	....	...	*5*	....	....	*1*	....	....	....	....	....	....	....	*23*
....	....	....	....	....	...	1	....	....	....	....	....	....	....	....	....	5	55
....	....	5	1	....	...	4	2	....	....	1	....	1	...	1	....	12	56
....	....	2	....	....	...	3	2	....	....	....	1	3	1	1	....	19	57
8	....	9	....	21	...	175	54	10	2	1	2	2	3	2	....	34	58
4	....	*3*	....	*50*	*1*	*418*	*90*	*44*	*1*	*3*	....	*3*	....	*2*	....	*23*	*20*
....	....	....	....	....	...	1	....	....	....	1	....	2	2	....	1	4	59
2	....	3	2	....	1	5	1	....	....	....	....	....	1	2	....	18	60
2	....	*11*	*1*	....	...	*5*	*1*	....	....	....	....	....	*1*	*1*	....	*6*	*21*
1	....	....	....	....	...	7	1	....	....	....	....	3	5	3	....	18	61
20	....	7	1	39	...	11	4	3	....	1	2	4	1	3	1	30	62
1	....	4	1	14	3	53	12	3	....	7	....	3	....	1	....	31	63
4	....	*2*	....	*4*	...	*63*	*25*	*14*	....	*4*	....	*3*	*2*	*3*	....	*24*	*22*
3	....	....	....	....	...	1	2	....	....	....	....	....	....	....	....	6	64
123	1	53	6	398	17	18	8	2	....	42	8	27	10	33	7	300	53
5	....	....	....	8	2	....	....	....	....	3	1	....	....	....	1	16	50
38	....	*4*	....	*18*	...	*3*	*2*	....	....	....	*1*	*1*	*3*	*7*	*5*	*45*	*20*
....	....	....	....	....	...	....	....	....	....	....	1	....	....	3	....	9	51
26	....	3	....	82	3	3	2	....	....	7	....	1	....	2	....	29	52
27	....	....	....	*5*	..	....	*1*	....	....	*1*	....	....	....	*2*	....	*11*	*21*
....	....	....	....	10	1	....	....	....	....	2	1	....	....	1	....	13	53
....	....	....	...	*8*	...	....	....	....	....	*2*	....	*2*	*2*	*1*	....	*9*	*22*
10	....	12	2	....	2	....	....	....	....	....	....	....	....	1	....	9	54
....	....	....	....	....	...	....	....	....	....	*1*	....	*2*	....	....	....	*9*	*23*
7	1	14	2	42	2	2	1	1	....	2	1	3	1	2	1	36	55
....	....	*18*	*1*	*63*	*3*	*3*	*1*	....	....	*17*	*3*	*8*	*1*	*5*	....	*64*	*24*
1	....	....	....	2	...	....	....	....	....	....	....	....	....	....	....	7	56
5	....	1	....	5	...	....	1	1	....	1	....	....	....	2	....	6	57
3	....	*1*	*1*	*7*	...	*3*	....	....	....	*4*	....	....	....	*3*	....	*12*	*25*
1	....	....	....	148	4	4	....	....	....	2	....	10	3	4	....	25	58
131	4	18	....	949	18	49	19	11	6	33	20	84	24	51	13	375	54
87	3	13	....	829	12	37	6	10	5	19	9	67	14	27	7	190	01
4	....	....	....	....	1	....	....	....	....	....	....	....	2	3	1	10	50
....	....	....	....	23	...	3	....	....	....	1	2	1	1	....	....	12	51
....	....	1	....	....	...	....	1	....	1	2	4	2	1	2	....	19	52
....	....	....	....	*56*	...	....	....	....	....	....	*1*	*3*	*1*	*1*	....	*10*	*20*
....	....	....	....	....	...	....	....	....	....	....	....	*1*	....	....	....	*2*	*21*
....	....	....	....	....	...	....	....	....	....	1	....	1	1	3	....	3	53
10	....	....	....	1	1	4	2	....	....	2	1	....	....	2	1	18	54
20	....	*2*	....	....	*2*	*3*	....	....	....	*1*	*1*	*2*	*2*	*3*	*1*	*20*	*22*
2	1	....	....	1	...	....	1	1	....	....	....	1	1	....	2	11	55
....	....	....	....	*3*	...	....	....	....	....	....	....	*1*	....	....	....	*1*	*25*
....	....	2	....	....	...	1	1	....	....	2	1	....	....	....	1	26	56
....	....	....	....	....	...	....	....	....	....	....	....	....	....	4	....	13	57
....	....	....	....	....	...	....	....	....	....	....	....	....	....	....	....	*3*	*23*
2	....	....	....	27	2	....	7	....	....	4	1	3	...	5	....	21	58
6	....	....	....	*9*	...	*1*	*1*	....	....	*1*	....	*2*	*1*	*1*	....	*16*	*24*
192	5	66	13	1,276	37	188	118	13	9	89	47	180	73	78	23	816	55
36	2	34	5	489	11	61	38	3	4	13	15	36	21	29	12	309	01
....	....	....	1	....	...	....	....	....	....	....	....	....	1	....	....	5	50
1	....	4	1	101	7	4	6	....	....	2	1	13	3	4	1	31	51
....	....	....	....	....	...	....	....	....	....	....	....	....	....	....	....	....	*20*
15	....	2	1	13	...	8	3	....	....	2	....	2	1	....	....	4	52
....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	2	53

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Deaths, ages at death: Under 1	Deaths, ages at death: 1–4	Deaths, ages at death: 60 and over	Cause — Important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	ULSTER CO. — (*Concluded*)												
54	Hurley	12	...	13	2	...	5	...	...	...	...	...	1
55	Kingston	1	1	2	1	...	1	...	...	...	...	...	...
56	Lloyd	69	...	44	6	2	22	3	1	36	...	21	1
57	Marbletown	17	2	35	2	...	19	1	...	20	...	9	...
58	Marlborough	66	...	42	9	2	17	...	...	1	...	1	...
21	*Marlboro, village*	*17*	...	*14*	*1*	...	*9*	...	...	*1*	...	...	...
59	New Paltz	18	...	31	...	...	26	...	...	31	...	6	...
22	*New Paltz, village*	*9*	...	*22*	*1*	...	*15*	...	...	*39*	...	...	...
60	Olive	19	1	20	1	2	13	2	...	18	...	4	...
61	Plattekill	22	2	18	1	...	16	...	...	7	...	...	...
62	Rochester	27	1	35	3	1	15	1	...	95	1	2	...
63	Rosendale	12	...	31	...	...	19	...	1	16	...	3	...
23	*Rosendale, village*	*4*	*1*	*12*	...	...	*7*	*1*	...	*8*	...	*2*	...
64	Saugerties	100	3	65	9	2	27	3	1	18	...	13	...
24	*Saugerties, village*	*60*	*3*	*72*	*6*	*2*	*32*	...	...	*4*	...	*16*	...
65	Shandaken	37	1	40	5	2	24	5	...	28	...	1	...
25	*Pine Hill, village*	*3*	...	*8*	*1*	...	*5*	...	...	*2*	...	...	...
66	Shawangunk	42	...	30	3	...	17	2	1	20	...	9	...
67	Ulster	41	1	40	7	5	14	1	...	...	3	...	...
68	Wawarsing	53	8	54	4	4	19	3	1	39	...	3	...
26	*Ellenville, village*	*43*	*1*	*60*	*2*	*1*	*33*	...	...	*4*	...	*5*	...
69	Woodstock	28	...	22	2	...	11	...	...	9	...	...	...
10	Eastern New York Reformatory, Napanoch	...	...	...	...	...	...	...	...	...	...	...	...
56	WARREN COUNTY	680	30	503	59	16	268	2	4	13	...	12	1
01	**Glens Falls, city**	401	21	274	33	6	140	...	2	8	...	2	...
50	Bolton	25	...	20	3	...	12	...	1	3	...	1	...
51	Caldwell	7	...	9	...	...	6	...	...	2	...	2	...
20	*Lake George, village*	*5*	...	*12*	...	...	*8*	...	...	...	...	*1*	...
52	Chester	29	...	19	3	2	10	...	...	1	...	...	...
53	Hague	9	1	12	...	2	7	...	...	...	...	6	...
54	Horicon	17	1	8	...	...	4	...	...	...	...	...	1
55	Johnsburg	46	...	35	5	...	23	1	...	...	...	...	...
56	Luzerne	17	...	15	2	1	8	...	...	...	...	...	...
57	Queensbury	53	2	28	3	1	14	1	1	...	...	...	...
58	Stony Creek	19	1	15	2	2	6	...	...	...	...	...	...
59	Thurman	12	1	9	1	1	6	...	...	...	...	...	...
60	Warrensburg	40	3	47	7	1	24	...	...	...	...	...	...
57	WASHINGTON COUNTY	810	32	613	61	21	363	14	...	199	1	10	...
50	Argyle	19	2	29	1	1	22	...	...	2	...	3	...
20	*Argyle, village*	*7*	...	*8*	...	...	*8*	...	...	...	...	...	...
51	Cambridge	11	2	13	2	...	7	...	...	2	...	...	...
21	*Cambridge, village (65)*	*37*	*2*	*50*	*1*	*1*	*36*	*2*	...	*4*	...	...	...
52	Dresden	9	1	7	2	...	3	...	...	1	...	...	...
53	Easton	27	2	16	1	...	12	...	...	11	...	...	...
22	*Greenwich, village (57)*	*33*	*2*	*28*	*2*	...	*19*	*4*	...	*12*	*1*	...	...
54	Fort Ann	22	4	27	2	2	17	...	...	...	...	...	...
23	*Fort Ann, village*	*3*	*1*	*5*	...	...	*4*	*1*	...	...	...	...	...
55	Fort Edward	29	...	10	2	...	4	2	...	3	...	...	...
24	*Fort Edward, village*	*89*	*3*	*39*	*3*	*2*	*20*	*2*	...	*5*	...	*2*	...
56	Granville	42	3	33	5	...	15	...	...	24	...	...	...
25	*Granville, village*	*66*	*1*	*35*	*7*	...	*17*	...	...	*102*	...	...	...
57	Greenwich (22)	51	1	34	4	3	20	...	...	1	...	...	...
58	Hampton	10	...	7	1	3	3	...	...	...	...	...	...

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35: Pulmonary, 28-29		Tuberculosis, 28-35: Other forms, 30-35		Pneumonia, 91-92: Broncho, 91		Pneumonia, 91-92: Lobar and unqualified, 92		Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
							1				1					10	54
										2			1			1	55
9		2		63	1	15	4	1	2	4		10	3	3	1	28	56
				41	4	6	2			3	1	1	2	3	1	22	57
3		2	2		1	2					3		2	4	1	29	58
3						*4*					*1*		*2*	*1*		*10*	*21*
7				3	1	7	2	1				3	3	1		24	59
2						*2*					*1*	*7*	*6*	*3*		*12*	*22*
		1		21		1						3	1		2	17	60
		1		19		6	2			4	2			4		10	61
8				79	1	3	5	1	1	3	1	6	3	1	2	20	62
					2	4	4		1				2	1		20	63
					1	*1*	*1*									*10*	*23*
21	2	1		176	2	21	12			12	5	36	3	3		37	64
46	*1*	*1*		*164*		*17*	*12*	*3*		*20*	*3*	*28*	*6*	*5*		*45*	*24*
					1	12	5	4			2	1	1	2	1	28	65
											1			*1*		*6*	*25*
8		1		45	1	6	1			4		2	1	1	1	24	66
			1				3				2		2	2	1	26	67
4		3	1	32		4	8			4	3	8	5	3		33	68
		11	*1*	*24*		*1*	*4*		*1*	*6*	*4*	*10*	*2*	*5*		*43*	*26*
29		3		6	3	3	4			10	1	14	2	2		10	69
																	10
35	1	9	1	224	17	87	25	4	4	30	19	47	23	37	8	363	56
19	1	7	1	12	3	38	18	2	3	22	10	27	12	28	6	190	01
				7	1	15	1					5		1		16	50
3				5		5										9	51
				37		*6*	*1*	*1*						*1*		*10*	*20*
4					1					4	4			1	1	12	52
		1		1	1	7										11	53
							1			1	1					5	54
				13	1	9	1			1		1	4	2		27	55
		1		3	1	3	1	1						1		12	56
9					1				1	1		2	1		1	23	57
				2	3									1		11	58
				29	2	1						2	1			6	59
				115	3	3	2			1	4	10	5	2		31	60
53	4	25	5	246	16	52	25	6	2	46	25	41	32	48	7	448	57
	1						1			1		2	3	2		22	50
						1	*1*					*3*	*1*	*1*		*5*	*20*
				9		1				1						13	51
1				*31*		*3*	*2*			*8*	*1*		*1*	*7*		*39*	*21*
							1						2			4	52
														2		14	53
					2	*6*	*3*					*3*	*2*			*20*	*22*
9	1			10		1	1			1			1		1	23	54
																5	*23*
		2		9		2				3	1	8	2	1		6	55
8		*7*	*2*	*40*		*3*	*1*	*1*		*8*	*2*	*6*	*2*	*4*		*28*	*24*
7	1	4	2	11	4	6	1	2	1	4	3		2	4		15	56
6				*18*		*15*	*4*	*2*	*1*	*2*		*4*	*2*	*2*	*1*	*25*	*25*
					4	1	1				3		1	2		23	57
					1	1								1	2	3	58

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Deaths, ages at death: Under 1	Deaths, ages at death: 1–4	Deaths, ages at death: 60 and over	Cause, important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	WASHINGTON CO. — (*Concluded*)												
59	Hartford	20	......	15	....	....	9	....	....	......	....	......	....
60	Hebron	15	......	15	....	....	10	....	....	3	....	......	....
61	Jackson	11	......	8	....	....	3	....	....	......	....	......	....
62	Kingsbury	26	1	19	4	1	10	....	....	......	....	......	....
26	*Hudson Falls, village*	*94*	*3*	*79*	*9*	*2*	*49*	....	....	......	....	*1*	....
63	Putnam	12	......	4	....	....	3	....	....	2	....	......	....
64	Salem	23	1	20	3	....	11	....	....	8	....	......	....
27	*Salem, village*	*9*	......	*19*	....	....	*15*	....	....	*2*	....	......	....
65	White Creek (21)	10	......	18	2	....	13	....	....	......	....	......	....
66	Whitehall	14	......	16	4	1	7	....	....	3	....	......	....
28	*Whitehall, village*	*121*	*3*	*58*	*6*	*5*	*32*	*3*	....	*14*	....	*4*	....
10	Great Meadow Prison, Comstock	......	......	1	....	....	....	....	....	......	....	......	....
58	WAYNE COUNTY	864	24	695	64	21	400	13	3	1,000	4	83	1
50	Arcadia	39	2	24	3	....	11	1	....	70	2	12	....
20	*Newark, village*	*102*	*3*	*76*	*8*	*3*	*42*	*3*	*1*	*299*	....	*11*	....
51	Butler	19	1	21	2	....	10	....	....	37	....	1	....
21	*Wolcott, village (64)*	12	......	27	....	1	17	....	....	19	....	......	....
52	Galen	29	......	14	2	1	8	....	....	18	....	......	....
22	*Clyde, village*	40	......	40	8	1	21	2	....	62	....	......	....
53	Huron	18	......	21	3	....	15	....	....	15	....	1	....
54	Lyons	27	1	24	2	1	18	....	....	9	....	8	....
23	*Lyons, village*	*100*	*1*	*63*	*7*	*1*	*39*	*3*	....	*26*	....	*2*	....
55	Macedon	33	3	20	3	1	9	....	....	10	....	3	....
24	*Macedon, village*	*10*	......	*11*	....	*1*	*9*	....	....	*1*	....	......	....
56	Marion	44	2	29	6	2	11	1	....	54	....	11	....
57	Ontario	53	......	39	3	....	25	2	1	45	....	10	....
58	Palmyra	34	2	21	1	1	11	....	....	11	....	2	....
25	*Palmyra, village*	*35*	*1*	*33*	*2*	....	*24*	....	....	*49*	....	......	....
59	Rose	35	1	36	4	....	22	....	....	86	....	......	....
60	Savannah	16	1	15	1	1	12	....	....	6	....	3	....
26	*Savannah, village*	*7*	*1*	*11*	*1*	....	*8*	....	....	*2*	....	*2*	....
61	Sodus	65	1	53	3	....	29	....	....	35	....	4	1
28	*Sodus, village*	*15*	......	*17*	*1*	*1*	*8*	....	....	*30*	....	*3*	....
62	Walworth	46	1	26	1	2	13	....	....	33	1	2	....
63	Williamson	55	1	37	2	2	21	....	....	69	....	7	....
64	Wolcott (21)	22	2	22	1	2	11	1	1	14	1	1	....
27	*Red Creek, village*	*6*	......	*6*	....	....	*5*	....	....	......	....	......	....
10	Newark State Custodial Asylum	2	......	9	....	....	1	....	....	......	....	......	....
59	WESTCHESTER COUNTY	7,379	271	4,205	584	255	1536	87	5	4,370	31	519	12
01	**Peekskill, village**	335	15	226	30	8	101	2	....	49	....	30	1
02	**White Plains, city**	477	14	267	31	14	86	2	1	552	1	59	3
03	**Mount Vernon, city**	956	34	524	78	52	207	26	....	687	14	43	....
04	**New Rochelle, city**	673	37	401	44	16	149	8	....	493	2	66	2
05	**Ossining, village**	228	9	132	13	6	46	7	1	145	....	33	....
06	**Port Chester, village**	545	20	208	36	16	61	6	1	45	....	8	....
07	**Yonkers, city**	2,399	87	1,153	212	81	349	4	....	869	9	85	3
50	Bedford	45	......	55	2	1	26	2	....	72	....	16	....
20	*Mt. Kisco, village (58)*	*136*	7	*71*	*18*	7	*19*	....	....	*198*	*3*	8	*1*
51	Cortlandt	88	2	45	3	1	14	....	....	105	....	13	....
21	*Croton-on-Hudson, village*	*31*	*1*	*21*	*3*	*1*	*5*	....	....	*3*	....	*3*	....
52	Eastchester	38	1	24	5	....	8	1	....	82	....	4	....
22	*Bronxville, village*	*94*	*2*	*53*	*9*	*2*	*15*	*1*	....	*73*	....	*13*	....
23	*Tuckahoe, village*	*97*	*3*	*29*	*8*	*3*	*9*	*3*	....	*31*	....	*17*	....
53	Greenburgh	41	2	41	5	2	22	....	1	79	....	8	....

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35: Pulmonary, 28-29		Tuberculosis, 28-35: Other forms, 30-35		Pneumonia, 91-92: Broncho, 91		Pneumonia, 91-92: Lobar and unqualified, 92		Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
....	....	....	....	....	1	....	....	....	....	....	....	....	1	1	....	12	59
14	....	....	....	10	....	....	....	....	....	1	....	2	1	1	....	13	60
....	....	....	....	10	....	1	....	....	....	....	....	1	1	....	....	7	61
2	....	....	....	3	2	1	1	....	....	1	1	....	....	1	....	14	62
....	....	3	....	1	1	1	4	....	....	2	6	2	4	8	1	55	26
....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	4	63
....	....	....	....	17	....	....	....	....	....	1	1	....	1	....	....	18	64
4	....	....	....	43	....	2	....	....	....	2	2	1	....	2	....	15	27
....	....	2	....	27	....	2	2	....	....	6	....	4	2	1	1	12	65
....	....	....	....	....	....	....	....	....	....	2	1	3	2	1	....	12	66
2	1	7	1	7	1	5	2	1	....	3	4	1	1	7	1	40	28
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	10
139	1	103	....	1,188	24	48	28	7	9	68	29	58	34	54	12	496	58
2	....	4	....	57	1	5	1	....	1	3	2	7	....	2	1	14	50
10	....	3	....	38	3	12	4	1	1	12	1	6	5	5	5	51	20
10	....	4	....	41	....	....	1	....	1	2	1	2	....	2	....	16	51
26	....	1	....	3	2	....	1	....	....	5	....	2	....	4	....	20	21
11	....	9	....	112	1	....	1	1	1	4	1	1	1	....	....	9	52
16	....	56	....	240	1	1	....	2	1	12	2	4	....	4	3	29	22
....	....	....	....	5	....	....	....	....	....	2	....	....	....	....	....	21	53
....	....	....	....	....	....	2	1	....	....	....	1	1	2	3	....	17	54
....	....	....	....	....	3	6	1	....	....	....	8	....	2	1	....	48	23
5	1	2	....	5	1	1	....	....	....	4	2	....	1	3	1	11	55
....	....	1	....	2	1	....	....	....	....	....	3	....	....	....	....	7	24
....	....	3	....	119	1	....	....	....	....	1	2	1	....	1	....	25	56
4	....	1	....	43	2	2	3	....	....	3	2	10	4	3	....	24	57
....	....	1	....	33	1	2	1	....	....	....	....	2	4	1	1	13	58
....	....	2	....	8	....	2	1	1	2	2	1	4	3	5	....	21	25
35	....	7	....	40	1	1	....	....	....	2	....	....	2	3	....	30	59
4	....	2	....	60	....	2	....	....	....	1	....	1	....	....	....	15	60
....	....	1	....	27	1	2	1	....	....	3	1	1	2	2	....	4	26
1	....	8	....	190	3	6	1	1	1	8	....	5	2	5	....	40	61
1	....	2	....	79	2	1	....	....	....	1	1	2	....	2	....	12	28
7	....	....	....	7	....	....	4	....	....	....	1	5	1	....	....	19	62
5	....	1	....	65	....	2	3	....	....	2	....	3	3	5	....	26	63
2	....	....	....	11	....	1	2	1	1	1	....	1	2	2	1	12	64
....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	6	27
....	....	....	....	....	....	....	2	....	....	....	....	....	....	1	....	6	10
1318	33	821	56	2,662	145	432	312	35	51	466	189	821	283	406	115	2,567	59
19	....	61	4	101	11	17	8	1	1	13	6	37	12	24	8	151	01
90	1	38	1	3	10	35	15	5	7	48	4	81	30	25	3	166	02
226	6	123	5	889	32	44	23	3	8	71	30	139	34	39	12	321	03
102	1	29	2	252	11	43	17	2	3	82	42	66	26	40	5	250	04
27	....	61	3	220	8	7	7	1	1	24	4	20	14	13	4	77	05
90	3	81	5	152	11	27	11	1	2	14	9	59	14	14	4	134	06
376	12	267	25	259	28	154	121	13	22	60	58	245	81	87	55	652	07
3	....	7	1	5	2	9	13	....	....	14	3	4	1	4	1	30	50
5	1	4	....	54	1	10	4	1	....	16	5	8	4	6	2	44	20
7	....	8	1	40	....	6	3	....	....	3	1	2	2	6	....	32	51
1	....	6	....	99	1	1	2	1	....	7	....	6	....	2	2	14	21
4	1	3	....	2	....	6	2	....	1	11	....	5	....	3	2	15	52
10	....	2	....	86	....	3	1	....	1	7	1	7	7	6	....	37	22
15	....	10	....	47	1	7	2	....	....	31	2	18	3	3	1	17	23
10	....	8	....	20	1	9	3	....	....	6	3	20	4	3	2	24	53

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups, and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	Births: Living births	Births: Stillbirths	Deaths: Total deaths at all ages	Ages at death: Under 1	Ages at death: 1–4	Ages at death: 60 and over	Cause, Important: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	WESTCHESTER CO.— (*Concl'ded*)												
24	*Ardsley, village*	10	....	9	2	....	2	1	....	33	....	15	....
25	*Dobbs Ferry, village*	122	7	53	8	4	17	....	....	46	....	1	....
26	*Hastings-on-Hudson, village*	107	2	30	10	1	9	1	....	18	....	3	....
27	*Irvington, village*	21	....	18	....	1	10	....	....	50	....	1	1
28	*Tarrytown, village*	159	6	71	10	5	29	....	....	4	....	4	1
39	*Elmsford, village*	27	2	12	3	1	2	....	....	8	....	1	....
54	Harrison	87	....	60	9	3	18	6	1	104	....	....	....
55	Lewisboro	26	....	10	1	....	6	1	....	6	....	1	....
56	Mamaroneck	25	1	17	1	....	8	2	....	31	1	3	....
29	*Larchmont, village*	31	....	22	1	1	13	1	....	80	....	5	....
30	*Mamaroneck, village (64)*	118	6	61	3	3	25	9	....	135	1	16	....
57	Mt. Pleasant	64	2	267	9	6	125	....	....	10	....	13	....
31	*Briarcliff Manor, village (61)*	7	....	9	1	....	1	1	....	48	....	1	....
32	*North Tarrytown, village*	116	2	59	4	9	27	....	....	30	....	4	....
33	*Pleasantville, village*	31	2	28	3	....	17	....	....	6	....	9	....
34	*Hillside, village**	....	....	....	....	....	....	....	....	....	....	....	....
58	Newcastle (20)	26	2	15	1	1	8	....	....	48	....	7	....
59	North Castle	23	....	21	3	1	11	....	....	16	....	4	....
60	North Salem	16	....	17	3	....	9	....	....	10	....	....	....
61	Ossining	3	....	3	....	....	2	....	....	25	....	2	....
(62	Pelham) †	....	....	....	....	....	....	....	....	....	....	....	....
35	*North Pelham, village*	18	....	19	2	....	12	....	....	27	....	1	....
36	*Pelham, village*	4	....	5	1	....	2	....	....	15	....	....	....
37	*Pelham Manor, village*	4	....	16	1	....	12	....	....	34	....	5	....
63	Poundridge	10	2	12	1	....	9	....	....	....	....	....	....
64	Rye (30)	8	....	4	....	....	3	....	....	8	....	....	....
38	*Rye, village*	71	2	45	5	5	19	2	....	113	....	6	....
65	Scarsdale	19	....	17	1	1	5	....	....	....	....	....	....
40	*Scarsdale*	....	....	....	....	....	....	....	....	14	....	8	....
66	Somers	9	....	13	1	2	7	....	....	8	....	1	....
67	White Plains (02) ‡	....	....	....	....	....	....	....	....	....	....	....	....
68	Yorktown	28	1	19	3	1	8	1	....	10	....	2	....
10	Sing Sing Prison	....	....	22	....	....	....	....	....	....	....	....	....
11	State Reformatory for Women, Bedford	6	....	1	....	....	....	....	....	....	....	....	....
60	WYOMING COUNTY	554	13	431	43	8	244	2	2	358	2	13	....
50	Arcade	17	....	6	1	1	1	....	....	1	....	....	....
20	*Arcade, village*	28	....	27	3	....	12	....	....	5	....	....	....
51	Attica	14	1	10	....	....	7	....	....	27	....	1	....
21	*Attica, village*	23	....	25	1	....	17	....	....	48	....	1	....
52	Bennington	24	1	14	2	....	8	....	....	29	....	....	....
53	Castile	15	....	10	1	....	7	....	....	3	....	....	....
22	*Castile, village*	12	2	13	....	....	9	....	....	5	....	....	....
23	*Perry, village (61)*	88	3	66	6	2	36	....	....	1	....	1	....
54	Covington	11	....	5	1	....	3	....	....	....	....	....	....
55	Eagle	28	....	10	1	....	5	....	....	1	....	....	....
56	Gainesville	22	2	24	4	....	10	1	1	4	....	....	....
24	*Gainesville, village*	8	....	7	2	1	2	....	....	1	1	....	....
25	*Silver Springs, village*	12	....	4	....	....	4	....	....	6	....	....	....
57	Genesee Falls	20	....	10	1	....	7	....	....	26	....	....	....
58	Java	24	....	20	1	....	11	....	....	49	1	2	....
59	Middlebury	10	1	13	1	....	6	....	....	9	....	....	....
28	*Wyoming*	9	....	6	....	....	5	....	....	2	....	....	....
60	Orangeville	17	....	23	....	....	20	....	....	12	....	....	....
61	Perry (23)	24	1	11	2	....	7	1	....	2	....	....	....

* Disorganized; cases and deaths included in town of Mt. Pleasant. † Disorganized; cases and deaths

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement from each State

OF SICKNESS OR DEATH

Reportable diseases: Whooping cough, 8 – Cases	Whooping cough, 8 – Deaths	Diphtheria, 9 – Cases	Diphtheria, 9 – Deaths	Influenza, 10 – Cases	Influenza, 10 – Deaths	Tuberculosis, 28-35: Pulmonary, 28-29 – Cases	Tuberculosis, 28-35: Pulmonary, 28-29 – Deaths	Tuberculosis, 28-35: Other forms, 30-35 – Cases	Tuberculosis, 28-35: Other forms, 30-35 – Deaths	Pneumonia, 91-92: Broncho, 91 – Cases	Pneumonia, 91-92: Broncho, 91 – Deaths	Pneumonia, 91-92: Lobar and unqualified, 92 – Cases	Pneumonia, 91-92: Lobar and unqualified, 92 – Deaths	Cancer, 39-45 – Deaths	Diarrhea and enteritis (under 2 years), 104 – Deaths	All other causes	District number
15	....	*1*	....	....	...	*1*	....	*1*	....	*3*	....	....	....	*1*	*1*	*7*	*24*
2	....	*4*	*1*	*8*	*1*	....	*1*	....	*1*	*1*	*1*	*2*	*1*	*2*	*1*	*44*	*25*
55	*3*	*15*	....	*4*	...	*3*	*2*	....	....	*11*	*1*	*8*	....	*3*	*1*	*20*	*26*
5	....	*4*	....	*6*	...	....	....	....	....	*2*	....	*3*	*3*	*3*	....	*11*	*27*
....	*1*	*3*	*1*	....	*2*	*2*	*2*	....	....	....	....	*3*	*3*	*8*	....	*53*	*28*
1	....	*4*	....	*14*	...	*1*	....	....	....	*1*	....	*2*	*1*	....	....	*11*	*39*
1	1	9	....	6	6	2	5	4	....	10	3	9	2	5	2	35	54
....	....	....	....	1	...	1	....	....	....	....	....	1	....	2	....	8	55
3	....	....	....	15	...	1	1	....	....	1	....	3	....	3	....	12	56
25	....	....	....	*36*	...	*1*	....	....	....	*4*	....	*9*	*6*	*4*	....	*12*	*29*
9	....	*4*	....	*2*	*1*	*8*	*5*	....	....	*7*	*2*	*13*	*5*	*4*	....	*43*	*30*
25	1	6	1	1	5	4	44	....	1	1	5	3	10	69	....	131	57
3	....	*1*	....	*33*	*1*	*2*	*1*	....	....	....	....	*1*	....	....	....	*7*	*31*
6	*2*	*3*	*1*	*3*	*5*	*6*	*3*	....	....	*2*	*6*	*1*	*2*	*4*	*1*	*35*	*32*
13	....	*9*	....	....	*1*	*2*	*5*	....	....	*2*	*1*	*6*	*2*	*5*	....	*14*	*33*
....	....	....	....	....	...	....	....	....	....	....	....	....	....	....	....	....	*34*
6	....	15	1	1	1	....	1	....	....	....	....	2	1	1	....	10	58
18	....	4	1	3	...	1	1	....	....	....	1	1	1	4	3	10	59
7	....	....	....	10	...	2	1	....	....	3	1	....	....	3	1	11	60
....	....	1	....	2	...	1	1	....	....	....	....	....	....	....	....	2	61
....	....	....	....	....	...	....	....	....	....	....	....	....	....	....	....	....	62
10	....	*1*	....	*8*	...	*3*	*1*	....	....	*4*	....	*1*	*2*	*1*	*1*	*14*	*35*
11	....	*2*	....	*17*	...	*1*	....	....	*1*	*2*	....	*2*	....	....	....	*4*	*36*
23	....	*8*	....	*12*	...	*1*	*1*	....	....	*1*	....	*5*	*2*	*1*	....	*18*	*37*
1	....	5	....	1	1	1	....	....	....	....	....	1	1	....	....	10	63
6	....	4	....	4	...	....	....	....	....	....	....	1	....	....	....	4	64
38	....	*7*	*3*	....	*3*	*7*	*1*	*2*	*1*	*1*	....	*8*	*3*	*3*	*1*	*30*	*38*
....	....	....	....	....	1	....	1	....	....	....	....	....	2	3	....	10	65
16	....	*1*	....	....	...	*1*	....	....	....	....	....	*2*	....	....	....	....	*40*
5	....	....	....	13	...	....	1	....	....	....	....	....	....	1	1	10	66
....	....	....	....	....	...	....	....	....	....	....	....	....	....	....	....	....	67
34	....	2	....	90	...	2	1	....	....	3	....	7	2	1	1	14	68
....	....	....	....	143	...	....	....	....	1	....	...	10	2	....	....	19	10
....	....	....	....	....	...	....	1	....	....	....	....	....	....	....	....	....	11
170	**2**	**46**	**3**	**954**	**17**	**22**	**24**	**4**	**2**	**42**	**14**	**67**	**28**	**31**	**3**	**303**	**60**
1	....	1	....	....	...	2	1	....	....	....	1	....	....	....	....	4	50
27	....	*1*	....	....	...	....	*1*	*1*	....	*3*	*2*	*7*	*4*	*6*	....	*14*	*20*
3	....	....	....	....	1	....	....	....	....	3	....	2	1	2	....	6	51
....	....	....	....	*1*	...	*7*	*6*	....	....	*1*	....	*1*	*2*	....	....	*17*	*21*
30	....	1	....	30	...	....	1	1	....	....	1	2	2	1	....	9	52
5	....	....	....	24	...	1	1	....	....	1	....	1	....	....	....	9	53
2	....	*1*	....	*21*	...	*1*	....	....	....	....	....	*1*	*1*	*1*	....	*11*	*22*
54	*1*	*20*	*3*	*359*	*6*	*4*	*5*	*2*	*1*	*11*	*1*	*18*	*8*	*4*	....	*37*	*23*
....	....	....	....	....	...	1	....	....	....	....	....	....	....	....	1	4	54
....	....	....	....	59	...	....	....	....	....	1	2	....	....	1	....	7	55
3	1	2	....	9	1	....	1	....	....	3	1	1	1	1	....	17	56
....	....	....	....	....	...	....	....	....	....	....	*1*	....	....	....	*1*	*4*	*24*
3	....	*6*	....	*31*	...	....	....	....	*1*	*4*	....	....	....	....	....	*3*	*25*
7	....	....	....	7	...	....	....	....	....	....	1	....	....	1	....	8	57
7	....	....	....	....	...	....	2	....	....	1	....	11	2	3	....	12	58
....	....	....	....	1	1	....	1	....	....	1	1	....	....	1	....	9	59
....	....	....	....	*17*	...	....	*1*	....	....	....	....	....	....	....	....	*5*	*28*
....	....	1	....	22	3	....	....	....	....	2	....	1	2	2	....	16	60
1	....	1	....	31	...	....	....	....	....	....	....	2	2	1	....	8	61

included in village of North Pelham. ‡ Disorganized; cases and deaths included in city of White Plains.

Table 17 — NEW YORK STATE (exclusive of New York City) — *General summary groups and cases and deaths from important reportable and other diseases, for each institution:* 1920 — (Continued)

District number	DISTRICT	BIRTHS: Living births	BIRTHS: Stillbirths	DEATHS: Total deaths at all ages	DEATHS, AGES AT DEATH: Under 1	1–4	60 and over	CAUSE, IMPORTANT: Typhoid fever, 1: Cases	Typhoid fever, 1: Deaths	Measles, 6: Cases	Measles, 6: Deaths	Scarlet fever, 7: Cases	Scarlet fever, 7: Deaths
	WYOMING CO. — *(Concluded)*												
62	Pike	9	......	6	....	....	6	....	....	12	....	1	....
26	*Pike, village*	*5*	......	*6*	....	....	*5*	....	....	*11*	....	*1*	....
63	Sheldon	34	......	15	3	....	9	....	....	65	....	1	....
64	Warsaw	26	1	14	3	....	4	....	....	23	....	1	....
27	*Warsaw, village*	*59*	*1*	*75*	*7*	*3*	*39*	....	*1*	*8*	....	*4*	....
65	Wethersfield	15	......	11	3	1	4	....	....	8	....	......	....
61	YATES COUNTY	254	6	270	18	12	176	7	3	99	....	20	1
50	Barrington	10	......	9	....	....	4	....	....	2	....	......	....
51	Benton	19	1	25	1	1	14	....	....	19	....	1	1
20	*Penn Yan, village.. (55)*	*74*	*2*	*87*	*5*	*6*	*47*	....	*1*	*43*	....	*4*	....
52	Italy	16	......	14	....	....	12	....	....	......	....	......	....
53	Jerusalem	30	1	42	3	2	27	3	1	......	....	12	....
54	Middlesex	18	1	6	1	....	5	....	....	2	....	......	....
55	Milo (20)	15	......	14	1	....	11	1	1	3	....	2	....
56	Potter	18	......	20	1	1	16	1	....	......	....	......	....
(21)	*Rushville, village (3456)**	*5*	......	*10*	*1*	....	*9*	....	....	......	....	......	....
57	Starkey	21	1	16	8	1	10	....	....	14	....	......	....
22	*Dundee, village*	*10*	......	*18*	....	....	*15*	....	....	*13*	....	......	....
58	Torrey	11	......	5	2	1	2	....	....	2	....	1	....
23	*Dresden, village*	*7*	......	*4*	....	....	*4*	*2*	....	*1*	....	......	....

* See Rushville, Ontario county

showing registration district numbers, births, stillbirths, total deaths by selected age registration district (city, village and town), with separate statement for each State

OF SICKNESS OR DEATH

REPORTABLE DISEASES

Whooping cough, 8		Diphtheria, 9		Influenza, 10		Tuberculosis, 28-35				Pneumonia, 91-92				Cancer, 39-45	Diarrhea and enteritis (under 2 years), 104	All other causes	District number
						Pulmonary, 28-29		Other forms, 30-35		Broncho, 91		Lobar and unqualified, 92					
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths		
12		3		13						2	1	1				5	62
7				16		1	1			2		5		1		4	26
		5		28						1		4	1	1	1	12	63
1				35	1					3				2		11	64
7		4		217	2	5	3			1	2	11	1	2		64	27
				33	2					2		1	1	1		7	65
15		**15**	**1**	**166**	**9**	**8**	**6**	**3**		**9**	**5**	**20**	**14**	**24**	**3**	**204**	**61**
		1		20										1		8	50
2		5	1		1		1					2	2	3		16	51
12		4		41	2	2	2	2		6	2	14	6	7	3	64	20
					1							1		1		12	52
		3			1	1				2	2	2	4	4		30	53
						1								3		3	54
1		1		43						1		1				13	55
					1		1				1					17	56
					1	1								1		8	21
						3	2						1	1		12	57
					1			1					1			16	22
		1		62										2		3	58
					1									1		2	23

for complete total.

Table 18 — NEW YORK STATE INSTITUTIONS* (exclusive of New York City): *Deaths, exclusive of stillbirths, classified by broad age groups and important causes:* 1920

Line number	INSTITUTION	Total deaths all causes (stillbirths excluded)	AGE IN YEARS: Under 1 year	1 to 4	Total under 5 years	5 to 9	10 to 14	15 to 19	Total 5 to 19	20 to 29	30 to 39	40 to 49	Total 20 to 49	50 to 59	60 and over	Unknown
	All deaths in State Institutions	3,344	175	24	199	16	29	46	91	278	405	490	1,173	522	1,355	4
1	Auburn State Prison	10	.....	.....	.....	....	....	....	....	5	5	....	10	....	....	.....
2	Binghamton State Hospital	211	.....	.....	.....	....	....	....	....	9	19	23	51	32	127	1
3	Buffalo State Hospital	226	.....	.....	.....	1	....	....	1	18	32	35	85	46	94	.....
4	Central Islip State Hospital	559	.....	.....	.....	....	1	5	6	60	102	125	287	110	154	2
5	Clinton Prison, Dannemora	11	.....	.....	.....	....	....	....	....	5	5	1	11	....	....	.....
6	Craig Colony, Sonyea	113	.....	.....	.....	1	7	16	24	29	25	15	69	13	7	.....
7	Dannemora State Hospital	13	.....	.....	.....	....	....	....	....	3	3	3	9	2	2	.....
8	Eastern New York Reformatory, Napanoch	......	.....	.....	.....	....	....	....	....	....	....	....	....	....	....	.....
9	Elmira State Reformatory	3	.....	.....	.....	....	....	....	....	3	....	....	3	....	....	.....
10	Gowanda State Hospital	70	.....	.....	.....	....	....	....	....	2	4	12	18	14	37	1
11	Great Meadow Prison, Comstock	1	.....	.....	.....	....	....	1	1	....	....	....	....	....	....	.....
12	Hudson River State Hospital	355	.....	.....	.....	....	1	....	1	22	45	62	129	60	165	.....
13	Kings Park State Hospital	294	.....	.....	.....	....	....	2	2	22	51	67	140	64	88	.....
14	Letchworth Village, Thiells	18	1	1	2	2	4	3	9	1	3	....	4	3	....	.....
15	Matteawan State Hospital	42	1	.....	1	....	....	....	....	5	8	9	22	5	14	.....
16	Middletown State Hospital	141	1	.....	1	....	....	....	....	2	7	22	31	40	69	.....
17	Newark State Custodial Asylum	9	.....	.....	.....	....	....	1	1	1	3	1	5	2	1	.....
18	Our Lady of Victory Infant Home, Lackawanna†	199	166	18	184	3	3	1	7	5	2	....	7	....	1	.....
19	Raybrook Hospital for Incipient Tuberculosis	12	.....	.....	.....	....	....	3	3	2	3	4	9	....	....	.....
20	Rochester State Hospital	159	.....	.....	.....	....	....	....	....	4	16	21	41	21	97	.....
21	Rome State Custodial Asylum	79	4	5	9	8	8	8	24	27	10	6	43	2	1	.....
22	St. Lawrence State Hospital	160	.....	.....	.....	....	....	....	....	6	17	28	51	27	82	.....
23	Sing Sing Prison	22	.....	.....	.....	....	....	3	3	15	3	1	19	....	....	.....
24	State Institution for Feeble-minded Children, Syracuse	9	.....	.....	.....	....	....	1	1	6	....	....	6	1	1	.....
25	State Reformatory for Women, Bedford	1	.....	.....	.....	....	....	....	....	....	1	....	1	....	....	.....

26	State Soldiers' and Sailors' Home, Bath	168	.....	.....	.....	....	....	....	....	....	....	1	1	1	166	....
27	State Training School for Girls, Hudson	3	1	.....	1	....	....	2	2	....	....	....	....	....	....	....
28	Utica State Hospital	138	.....	.....	.....	....	....	....	....	9	14	19	42	19	77	....
29	West Haverstraw Hospital for Deformed and Crippled Children	7	.....	.....	.....	1	5	....	6	....	1	....	1	....	....	....
30	Willard State Hospital	290	1	.....	1	....	....	....	....	17	26	35	78	60	151	....
31	Woman's Relief Corps Home, Oxford	21	.....	.....	.....	....	....	....	....	....	....	....	....	....	21	....

* On July 1, 1917, section 372 of the Vital Statistics Law was amended making " each state hospital, charitable or penal institution . . . a primary registration district."

† Not a State institution but constituted a separate district because of its large nonresident inmate population.

Table 18 — NEW YORK STATE INSTITUTIONS* (exclusive of New York City): *Deaths, exclusive of stillbirths, classified by broad age groups and important causes:* 1920 — (Continued)

			CAUSES OF DEATH																					
			GENERAL DISEASES													DISEASES OF THE NERVOUS SYSTEM			DISEASES OF THE CIRCULATORY SYSTEM		DISEASES OF THE RESPIRATORY SYSTEM			
										Tuberculosis												Pneumonia		
Line number	INSTITUTIONS	Total deaths all causes (stillbirths excluded)	Typhoid fever, 1	Smallpox, 5	Measles, 6	Scarlet fever, 7	Whooping cough, 8	Diphtheria, 9	Influenza, 10	Total (all forms), 28–35	Pulmonary, 28–29	Tuberculous meningitis, 30	Other forms, 31–35	Cancer, 39–45	Diabetes, 50	Cerebrospinal meningitis, 61b, c	Acute anterior poliomyelitis, 63a	Apoplexy and cerebral hemorrhage, 64	Organic heart disease, 79	Arteriosclerosis, 81	Bronchitis, 89–90	Total (all forms), 91–92	Broncho, 91	Lobar and unqualified, 92
	All deaths in State Institutions	3,344	3	....	13	1	1	10	48	529	507	4	18	74	10	....	....	102	563	255	23	289	151	138
1	Auburn State Prison	10	....	....	....	....	....	....	1	1	1	....	....	1	....	....	....	....	....	....	....	....	....	....
2	Binghamton State Hsopital	211	....	....	....	....	....	2	6	13	12	....	1	4	....	....	....	3	41	22	....	22	8	14
3	Buffalo State Hospital	226	....	....	....	....	....	2	1	35	33	....	2	5	1	....	....	5	21	9	....	38	19	19
4	Central Islip State Hospital	559	1	....	....	....	....	....	6	95	95	....	....	9	....	....	....	20	58	67	3	19	7	12
5	Clinton Prison, Dannemora	11	....	....	....	....	....	....	....	8	7	1	....	....	....	....	....	....	....	....	....	....	....	....
6	Craig Colony, Sonyea	113	....	....	....	....	....	1	1	22	22	....	....	....	....	....	....	4	9	1	....	27	19	8
7	Dannemora State Hospital	13	....	....	....	....	....	....	....	5	5	....	....	....	....	....	....	....	1	....	....	2	....	2
8	Eastern New York Reformatory, Napanoch	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
9	Elmira State Reformatory	3	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	1	1	....
10	Gowanda State Hsopital	70	....	....	....	....	....	....	....	7	7	....	....	3	....	....	....	1	13	1	....	14	4	10
11	Great Meadow Prison, Comstock	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
12	Hudson River State Hospital	355	....	....	....	....	....	....	8	71	69	....	2	7	....	....	....	13	47	70	....	28	20	8
13	Kings Park State Hospital	294	....	....	....	....	....	....	5	66	64	....	2	8	2	....	....	6	20	17	2	27	18	9
14	Letchworth Village, Thiells	18	....	....	....	....	....	....	....	3	2	....	1	....	....	....	....	....	1	....	....	2	2	....
15	Matteawan State Hospital	42	....	....	....	....	....	....	....	10	9	....	1	4	....	....	....	1	4	....	....	2	....	2

16	Middletown State Hospital	141							14	19	19			3	2			9	16	9	1	5	1	4
17	Newark State Custodial Asylum	9								2	2			1	1									
18	Our Lady of Victory Infant Home, Lackawanna†	199	1		12			4		3	1	2									11	23	11	12
19	Raybrook Hospital for Incipient Tuberculosis	12								12	12													
20	Rochester State Hospital	159								16	15		1	8				7	42	21	1	9	9	
21	Rome State Custodial Asylum	79			1	1	1	1	5	30	30								3	1	2	6	2	4
22	St. Lawrence State Hospital	160							1	22	22			3				11	59	1		12	5	7
23	Sing Sing Prison	22								1			1									2		2
24	State Institution for Feeble-minded Children, Syracuse	9								7	6		1					1	1					
25	State Reformatory for Women, Bedford	1								1	1													
26	State Soldiers' and Sailors' Home, Bath	168								1	1			8	2			8	102	19	1	2		2
27	State Training School for Girls, Hudson	3								2	2													
28	Utica State Hospital	138								10	10			3	1			6	57	1		9	2	7
29	West Haverstraw Hospital for Deformed and Crippled Children	7								5	3	1	1									1		1
30	Willard State Hospital	290	1							60	55		5	3	1			6	64	8		38	23	15
31	Women's Relief Corps Home, Oxford	21												4				1	4	8	2			

* See footnote, page 387.
† See footnote, page 387.

Table 18 — NEW YORK STATE INSTITUTIONS* (exclusive of New York City): *Deaths classified by broad age groups and important cases: 1920*— (Concluded)

Line number	INSTITUTIONS	CAUSES OF DEATH — (Concluded) DISEASE OF THE DIGESTIVE SYSTEM: Diarrhea and enteritis (under 2 years), 104	Appendicitis, 108	Hernia, intestinal obstruction, 109	Cirrhosis of liver, 113	Nephritis and Bright's disease, 119, 120	THE PUERPERAL STATE: Puerperal septicemia, 137	Other puerperal affections, 134–36, 138–41	MALFORMATIONS AND DISEASES OF EARLY INFANCY: Congenital malformations, 150	Premature birth, 151a	Congenital debility, 151b	Other causes peculiar to early infancy, 152, 153	Old age, 154	EXTERNAL CAUSES: Accidents: Total accidents, 164, 181, 185, 186	Drowning, 169	Railroad accidents, 175a	Automobile accidents, 175c	Other accidents	Suicides, 155–163	Homicides, 182–184	All other causes
	All deaths in State Institutions	61	9	23	12	252	....	1	16	9	3	20	2	55	4	1	....	50	19	5	936
1	Auburn State Prison	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	3
2	Binghamton State Hospital	....	....	4	....	20	....	....	....	....	....	....	....	6	....	1	....	5	1	1	57
3	Buffalo State Hospital	....	....	2	1	30	....	....	....	....	....	....	1	2	....	....	....	2	1	....	72
4	Central Islip State Hospital	....	2	....	3	37	....	....	....	....	....	....	....	2	....	....	....	2	5	....	232
5	Clinton Prison, Dannemora	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	2	....	....	1
6	Craig Colony, Sonyea	....	....	....	1	3	....	....	....	....	....	....	....	4	2	....	....	2	....	....	40
7	Dannemora State Hospital	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
8	Eastern New York Reformatory, Napanoch	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
9	Elmira State Reformatory	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
10	Gowanda State Hospital	....	....	1	....	4	....	....	....	....	....	....	....	1	....	....	....	1	1	....	24
11	Great Meadow Prison, Comstock	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....	....
12	Hudson River State Hospital	....	....	3	1	6	....	....	....	....	....	....	....	3	....	....	....	3	1	2	95
13	Kings Park State Hospital	....	1	3	1	26	....	....	....	....	....	....	....	2	....	....	....	2	2	....	106
14	Letchworth Village, Thiells	1	....	....	....	2	....	....	....	....	....	....	....	1	1	....	....	....	....	....	8
15	Matteawan State Hospital	....	....	....	....	4	....	....	....	....	....	1	....	1	....	....	....	1	....	....	15

16	Middletown State Hospital			2		16					1		1	2				2	1		40
17	Newark State Custodial Asylum			1										1				1			3
18	Our Lady of Victory Infant Home, Lackawanna†	54	4	1		1		1	16	9	2	17									40
19	Raybrook Hospital for Incipient Tuberculosis																				
20	Rochester State Hospital			1	1	7								4				4	1		41
21	Rome State Custodial Asylum	6		3										2	1			1			17
22	St. Lawrence State Hospital			1	2	13													2		33
23	Sing Sing Prison													16				16			8
24	State Institution for Feeble-minded Children, Syracuse																				
25	State Reformatory for Women, Bedford																				
26	State Soldiers' and Sailors' Home, Bath		1		2	14								1				1			7
27	State Training School for Girls, Hudson											1									
28	Utica State Hospital					9								1				1			41
29	West Haverstraw Hospital for Deformed and Crippled Children																				1
30	Willard State Hospital		1			49						1		3				3	2		53
31	Woman's Relief Corps Home, Oxford			1																	1

* See footnote, 387.
† See footnote, 387.

Table 19 — NEW YORK STATE: *Movement of mortality from the chief communicable diseases, showing the annual number of deaths and death rates per 100,000 population:* 1885–1920; also for* NEW YORK CITY and REST OF STATE: 1898–1920

YEAR	Population	Pulmonary Tuberculosis (28, 29,)†						Typhoid Fever (1)						Measles (6)					
		New York State		New York City		Rest of State		New York State		New York City		Rest of State		New York State		New York City		Rest of State	
		Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*
1885	5,550,690	11,238	202.5	......	......	......	......	1,067	19.2	......	......	......	......	1,170	21.1	......	......	......	......
1886	5,642,720	11,947	211.7	......	......	......	......	1,169	20.7	......	......	......	......	895	15.9	......	......	......	......
1887	5,734,751	11,609	202.4	......	......	......	......	1,327	23.1	......	......	......	......	1,205	21.1	......	......	......	......
1888	5,826,782	12,383	212.5	......	......	......	......	1,483	25.5	......	......	......	......	944	16.2	......	......	......	......
1889	5,918,813	12,390	209.3	......	......	......	......	1,550	26.2	......	......	......	......	899	15.2	......	......	......	......
1890	6,013,722	13,731	228.3	......	......	......	......	1,612	26.8	......	......	......	......	1,161	19.3	......	......	......	......
1891	6,140,294	13,445	219.0	......	......	......	......	1,926	31.4	......	......	......	......	1,200	19.5	......	......	......	......
1892	6,266,866	13,471	215.0	......	......	......	......	1,664	26.6	......	......	......	......	1,350	21.5	......	......	......	......
1893	6,393,438	13,123	205.3	......	......	......	......	1,685	26.4	......	......	......	......	789	12.3	......	......	......	......
1894	6,520,010	12,824	196.7	......	......	......	......	1,640	25.2	......	......	......	......	900	13.8	......	......	......	......
1895	6,646,582	13,267	199.6	......	......	......	......	1,716	25.8	......	......	......	......	1,266	19.0	......	......	......	......
1896	6,773,154	13,265	195.8	......	......	......	......	1,542	22.8	......	......	......	......	1,495	22.1	......	......	......	......
1897	6,899,726	12,641	183.2	......	......	......	......	1,351	19.6	......	......	......	......	873	12.7	......	......	......	......
1898	7,206,298	12,979	184.7	7,718	237.0	5,261	139.5	1,810	25.8	688	21.1	1,122	29.8	838	11.9	641	19.7	197	5.2
1899	7,152,870	13,412	187.5	8,046	240.1	5,366	141.1	1,604	22.4	546	16.3	1,058	27.8	756	10.6	589	17.6	167	4.4
1900	7,284,461	13,590	186.6	8,162	236.7	5,428	141.5	1,948	26.7	718	20.8	1,230	32.1	1,333	18.3	816	23.7	517	13.5
1901	7,471,268	13,766	184.3	8,141	227.2	5,625	144.7	1,741	23.3	727	20.3	1,014	26.1	859	11.5	444	12.1	415	10.7
1902	7,658,075	12,582	164.3	7,589	204.1	4,993	126.7	1,718	22.4	762	20.5	956	24.3	929	12.1	710	19.1	219	5.6
1903	7,844,882	13,194	168.2	7,990	207.4	5,204	130.3	1,665	21.2	634	16.5	1,031	25.8	721	9.2	506	13.1	215	5.4
1904	8,031,689	14,159	176.3	8,516	213.6	5,643	139.5	1,652	20.6	659	16.5	993	24.6	1,170	14.6	880	22.1	290	7.2
1905	8,218,496	14,061	171.1	8,528	206.9	5,533	135.1	1,554	18.9	635	15.4	919	22.4	988	12.0	517	12.5	471	11.5
1906	8,405,303	14,027	166.9	8,976	210.9	5,051	121.7	1,568	18.7	639	15.0	929	22.4	1,369	16.3	1,147	26.9	222	5.4
1907	8,592,110	14,431	168.0	8,996	204.9	5,435	129.4	1,673	19.5	740	16.9	933	22.2	997	11.6	728	16.6	269	[illegible].4
1908	8,778,917	14,347	163.4	8,867	195.9	5,480	128.8	1,375	15.7	538	11.9	837	19.7	1,175	13.4	972	21.5	203	4.8
1909	8,965,724	13,996	156.1	8,645	185.5	5,351	124.3	1,315	14.7	564	12.1	751	17.4	1,272	14.2	996	21.4	276	6.4

1910	9,140,902	14,287	156.3	8,881	185.6	5,406	124.1	1,374	15.0	558	11.7	816	18.7	1,285	14.1	774	16.2	511	11.7
1911	9,271,883	14,491	156.3	8,967	184.0	5,524	125.6	1,316	14.2	545	11.2	771	17.5	977	10.5	658	13.5	319	7.3
1912	9,402,865	14,007	149.0	8,781	177.0	5,226	117.7	1,128	12.0	499	10.1	629	14.2	1,050	11.2	673	13.6	377	8.5
1913	9,533,847	14,096	147.9	8,842	175.1	5,254	117.1	1,018	10.7	362	7.2	656	14.6	1,072	11.2	628	12.4	444	9.9
1914	9,664,828	14,586	150.9	9,138	177.9	5,448	120.3	878	9.1	334	6.5	544	12.0	839	8.7	559	10.9	280	6.2
1915	9,795,810	14,512	148.1	9,108	174.3	5,404	118.2	775	7.9	333	6.4	442	9.7	844	8.6	630	12.1	214	4.7
1916	9,926,791	14,069	141.7	8,663	163.1	5,406	117.2	603	6.1	215	4.0	388	8.4	928	9.3	489	9.2	439	9.5
1917	10,057,773	14,795	147.1	9,120	168.9	5,675	121.8	593	5.9	229	4.2	364	7.8	904	9.0	560	10.4	344	7.4
1918‡	10,188,755	15,052	147.7	8,973	163.5	6,079	129.3	575	5.6	196	3.6	379	8.1	1,281	12.6	790	14.4	491	10.4
1919	10,319,736	12,814	124.2	7,535	135.1	5,279	111.3	374	3.6	121	2.2	253	5.3	355	3.4	218	3.9	137	2.9
1920	10,450,716	11,030	105.5	6,269	110.7	4,761	99.5	371	3.5	138	2.4	234	4.9	1,101	10.5	736	18.0	365	7.6

* See footnotes of tables 1 and 2, pages 239 and 240.

† In 1910 a new title (29) was made in the *International List of Causes of Death* for Acute Miliary Tuberculosis which previously had been included under Title 27 (now 28) — Tuberculosis of Lungs. From 1910 through 1913, this title was excluded from the State totals for Pulmonary Tuberculosis, rendering the data for these years not entirely comparable with previous years. A revision of these totals to include Title 29 has been made for 1910–1913 and slight increases in rates will be noted as compared with rates previously published.

‡ Civilian deaths only, except for New York City.

Table 19 — NEW YORK STATE: ***Movement of mortality from the chief communicable diseases, showing the annual number of deaths and death rates per 100,000 population**:** **1885–1920;** ***also for*** **NEW YORK CITY and REST OF STATE: 1898–1920 — (Concluded)**

YEAR	Population	SCARLET FEVER (7)						WHOOPING COUGH (8)						DIPHTHERIA (9)					
		NEW YORK STATE		NEW YORK CITY		REST OF STATE		NEW YORK STATE		NEW YORK CITY		REST OF STATE		NEW YORK STATE		NEW YORK CITY		REST OF STATE	
		Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*
1885	5,500,690	1,184	21.3	......	......	......	......	834	15.0	......	......	......	......	4,508	81.2	......	......	......	......
1886	5,642,720	1,011	17.9	......	......	......	......	1,244	22.0	......	......	......	......	5,597	99.2	......	......	......	......
1887	5,734,751	1,267	22.1	......	......	......	......	447	7.8	......	......	......	......	6,490	113.2	......	......	......	......
1888	5,826,782	2,452	42.1	......	......	......	......	994	17.1	......	......	......	......	6,448	110.7	......	......	......	......
1889	5,918,813	2,205	37.3	......	......	......	......	1,303	22.0	......	......	......	......	5,855	98.9	......	......	......	......
1890	6,013,722	913	15.2	......	......	......	......	1,156	19.2	......	......	......	......	4,915	81.7	......	......	......	......
1891	6,140,294	2,252	36.7	......	......	......	......	825	13.4	......	......	......	......	5,072	82.6	......	......	......	......
1892	6,266,866	2,177	34.7	......	......	......	......	921	14.7	......	......	......	......	5,918	94.4	......	......	......	......
1893	6,393,438	1,626	25.4	......	......	......	......	1,203	18.8	......	......	......	......	5,947	93.0	......	......	......	......
1894	6,520,010	1,227	18.8	......	......	......	......	1,020	15.6	......	......	......	......	6,592	101.1	......	......	......	......
1895	6,646,582	850	12.8	......	......	......	......	1,169	17.6	......	......	......	......	4,989	75.1	......	......	......	......
1896	6,773,154	759	11.2	......	......	......	......	996	14.7	......	......	......	......	4,597	67.9	......	......	......	......
1897	6,899,726	841	12.2	......	......	......	......	825	12.0	......	......	......	......	4,115	59.6	......	......	......	......
1898	7,026,298	837	11.9	705	21.7	132	3.5	1,155	16.4	715	22.0	440	11.7	2,612	37.2	1,776	54.5	836	22.2
1899	7,152,870	730	10.2	533	15.9	197	5.2	886	12.4	514	15.3	372	9.8	2,786	38.9	1,925	57.5	861	22.6
1900	7,284,461	689	9.5	466	13.5	223	5.8	1,020	14.0	584	16.9	436	11.4	3,306	45.4	2,275	66.0	1,031	26.9
1901	7,471,268	1,430	19.1	1,162	32.4	268	6.9	721	9.7	292	8.1	429	11.0	3,026	40.5	2,067	57.7	959	24.7
1902	7,658,075	1,215	15.9	941	25.3	274	7.0	923	12.1	607	16.3	316	8.0	2,859	37.3	2,013	54.1	846	21.5
1903	7,844,882	1,057	13.5	737	19.1	320	8.0	811	10.3	334	8.7	477	11.9	3,035	38.7	2,185	56.7	850	21.3
1904	8,031,689	1,194	14.9	852	21.4	342	8.5	426	5.3	198	5.0	228	5.6	3,041	37.9	2,093	52.5	948	23.4
1905	8,218,496	726	8.8	469	11.4	257	6.3	847	10.3	409	9.9	438	10.7	2,296	27.9	1,538	37.3	758	18.5
1906	8,405,303	690	8.2	492	11.6	198	4.8	821	9.8	362	8.5	459	11.1	2,691	32.0	1,887	44.3	804	19.4
1907	8,592,110	1,032	12.0	797	18.2	235	5.6	789	9.2	394	9.0	395	9.4	2,603	30.3	1,741	39.6	862	20.5
1908	8,778,917	1,688	19.2	1,327	29.3	361	8.5	503	5.7	185	4.1	318	7.5	2,473	28.2	1,763	39.0	710	16.7
1909	8,965,724	1,205	13.4	787	16.9	418	9.7	783	8.7	401	8.6	382	8.9	2,313	25.8	1,715	36.8	598	13.9
1910	9,140,902	1,617	17.7	952	19.9	665	15.3	727	8.0	294	6.1	433	9.9	2,433	26.6	1,715	35.8	718	16.5

1911...........	9,271,883	1,149	12.4	741	15.2	408	9.3	819	8.8	383	7.9	436	9.9	1,963	21.2	1,284	26.3	679	15.4
1912...........	9,402,865	789	8.4	615	12.4	174	3.9	683	7.3	291	5.9	392	8.8	1,624	17.3	1,126	22.7	498	11.2
1913...........	9,533,847	837	8.8	507	10.0	330	7.4	822	8.6	420	8.3	402	9.0	1,853	19.4	1,334	26.4	519	11.6
1914...........	9,664,828	687	7.1	452	8.8	235	5.2	730	7.6	279	5.4	451	10.0	2,015	20.8	1,492	29.0	523	11.6
1915...........	9,795,810	415	4.2	291	5.6	124	2.7	759	7.7	396	7.6	363	7.9	1,770	18.1	1,278	24.5	492	10.8
1916...........	9,926,791	178	1.8	96	1.8	82	1.8	745	7.5	352	6.6	393	8.5	1,524	15.4	1,031	19.4	493	10.7
1917...........	10,057,773	259	2.6	120	2.2	139	3.0	894	8.9	489	9.1	405	8.7	1,755	17.4	1,158	21.4	597	12.8
1918...........	10,188,755	297	2.9	177	3.2	120	2.6	1,244	12.2	665	12.1	579	12.3	1,776	17.4	1,245	22.7	531	11.3
1919...........	10,319,736	268	2.6	136	2.4	132	2.8	292	2.8	161	2.9	131	2.8	2,055	19.9	1,239	22.2	816	17.2
1920...........	10,450,716	450	4.3	220	3.9	230	4.8	1,007	9.6	615	10.9	392	8.2	1,904	18.2	1,045	18.4	859	17.9

* See footnotes of tables 1 and 2, pages 239 and 240.

Table 20 — New York State: ***Movement of mortality from certain important causes of death, showing the annual number of deaths and death rates per 100,000 population*: 1900–1920 ‡***

Year	Pneumonia (All forms) (91, 92)		Apoplexy (Cerebral Hemorrhage) (64)		Organic Heart Disease and Endocarditis (78, 79)		Diseases of the Arteries, Arterio-sclerosis, Etc (81)		Summary of Diseases of the Cardio-vascular System (64, 78, 79, 81)		Acute Nephritis, Brights' Disease (119–120)		Cancer (39–45) (See also Table 21)		Suicide (155–163)		Violent Deaths—Suicide Excluded (164–186)		Diarrhea and Enteritis (104) Under 2 Years	
	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*
1900	16,596	227.8	5,831	80.0	9,657	132.6	369	5.1	15,857	217.7	8,628	118.4	4,871	66.9	858	11.8	5,707	78.3	‡8,969	123.1
1901	14,660	196.2	6,008	80.4	10,282	137.6	444	5.9	16,734	224.0	9,005	120.5	5,033	67.4	806	10.8	7,223	96.7	8,053	107.8
1902	14,085	183.9	6,083	79.4	10,894	142.3	604	7.9	17,581	229.6	9,035	118.0	4,990	65.2	894	11.7	6,138	80.2	7,016	91.6
1903	14,213	181.2	6,082	77.5	11,447	145.9	738	9.4	18,267	232.8	9,721	123.9	5,456	69.5	938	12.0	6,905	88.0	6,558	83.6
1904	17,402	216.7	6,633	82.6	13,274	165.3	897	11.2	20,804	259.0	10,674	132.9	5,697	70.9	1,031	12.8	8,110	101.0	8,417	104.8
1905	14,581	177.4	6,736	82.0	12,996	158.2	1,042	12.7	20,774	252.8	10,413	126.7	6,056	73.7	1,219	14.8	7,379	89.8	8,914	108.5
1906	15,519	184.6	6,645	79.1	13,584	161.6	1,165	13.9	21,394	254.5	10,926	130.0	6,168	73.4	1,188	14.1	7,948	94.6	9,249	110.0
1907	18,104	210.7	7,135	83.0	13,924	162.1	1,338	15.6	22,397	260.7	10,575	123.1	6,420	74.7	1,207	14.0	8,065	98.9	9,213	107.2
1908	14,852	169.2	6,198	70.6	13,624	155.2	2,118	24.1	21,940	249.9	9,883	112.6	6,554	74.7	1,511	17.2	7,300	83.2	9,111	103.8
1909	16,597	185.1	5,239	58.4	14,029	156.5	3,134	35.0	22,402	249.9	10,720	119.6	7,060	78.7	1,494	16.7	7,240	80.8	7,873	87.8
1910	17,115	187.2	5,556	60.8	14,380	157.3	3,363	36.8	23,299	254.9	11,217	122.7	7,522	82.3	1,479	16.2	7,840	85.8	9,036	98.9
1911	16,460	177.5	5,766	62.2	15,346	165.5	4,178	45.1	25,290	272.8	11,003	118.7	7,970	86.0	1,436	15.5	8,661	93.4	7,301	78.7
1912	16,537	175.9	5,863	62.4	15,807	168.1	4,392	46.7	26,062	277.2	11,897	126.5	8,250	87.7	1,340	14.3	8,121	86.4	7,035	74.8
1913	16,530	173.4	5,776	60.6	16,716	175.3	4,779	50.1	27,261	285.9	11,739	123.1	8,536	89.5	1,476	15.5	8,425	88.4	6,964	73.0
1914	15,510	160.5	6,716	69.5	20,682	214.0	3,956	40.9	31,354	324.4	11,308	117.0	8,906	92.1	1,516	15.7	8,134	84.2	6,287	65.1
1915	17,209	175.7	6,423	65.6	21,046	214.8	3,984	40.7	31,453	321.1	11,582	118.2	9,301	94.9	1,680	17.2	7,826	79.9	6,510	66.5
1916	17,314	174.4	6,471	65.2	21,837	220.0	4,466	45.0	32,774	330.2	12,801	129.0	9,419	94.9	1,492	15.0	8,599	86.6	5,387	54.3
1917	18,673	185.7	6,796	67.6	22,626	225.0	4,825	48.0	34,247	340.5	13,136	130.6	9,736	96.8	1,441	14.3	9,700	96.4	5,624	55.9
1918†	34,513	338.7	7,019	68.9	23,456	230.2	4,616	45.3	35,091	344.4	11,315	111.1	9,876	96.9	1,302	12.8	8,833	86.7	5,122	50.3
1919	17,096	165.7	6,638	64.3	20,644	200.0	4,685	45.4	31,967	309.8	10,540	102.1	10,166	98.5	1,294	12.5	7,863	76.2	4,191	40.6
1920	16,475	157.6	6,852	65.6	22,657	216.8	4,883	46.7	34,392	329.1	10,481	100.3	10,539	100.8	1,189	11.4	7,799	74.6	4,662	44.6

* See footnotes of tables 1 and 2, pages 239 and 240.
† Civilian deaths only, except for New York City.
‡ In the absence of State data previous to 1907, U. S. Census figures are used for all causes listed.

Table 21 — NEW YORK STATE: *Movement of mortality from cancer and other malignant tumors, showing the deaths and annual death rates per 100,000 population according to the organ or part of the body affected:* 1907–1920

YEAR	Cancer and Other Malignant Tumors: Total all forms, Deaths	Total all forms, Rate*	Buccal cavity (39), Deaths	Buccal cavity (39), Rate*	Stomach and liver (40), Deaths	Stomach and liver (40), Rate*	Peritoneum, intestines, rectum (41), Deaths	Peritoneum, intestines, rectum (41), Rate*	Female genital organs (42), Deaths	Female genital organs (42), Rate*	Breast (43), Deaths	Breast (43), Rate*	Skin (44), Deaths	Skin (44), Rate*	Other or unspecified organs (45), Deaths	Other or unspecified organs (45), Rate*	Year
1907	6,420	74.7	206	2.4	2,396	27.9	812	9.5	946	11.0	617	7.2	201	2.3	1,242	14.5	1907
1908	6,554	74.7	170	1.9	2,567	29.2	852	9.7	1,046	11.9	602	6.9	200	2.3	1,117	12.7	1908
1909	7,060	78.7	267	3.0	2,677	29.9	926	10.3	1,146	12.8	665	7.4	202	2.2	1,177	13.1	1909
1910	7,522	82.3	285	3.1	2,933	32.1	1,121	12.3	1,096	12.0	732	8.0	192	2.1	1,163	12.7	1910
1911	7,970	86.0	310	3.3	2,987	32.2	1,109	12.0	1,202	13.0	787	8.5	215	2.3	1,360	14.7	1911
1912	8,250	87.7	290	3.1	3,071	32.7	1,213	12.9	1,209	12.9	750	8.0	257	2.7	1,460	15.5	1912
1913	8,536	89.5	291	3.1	3,228	33.9	1,263	13.2	1,260	13.2	810	8.5	213	2.2	1,471	15.4	1913
1914	8,906	92.1	320	3.3	3,333	34.5	1,310	13.6	1,223	12.7	916	9.5	215	2.2	1,589	16.4	1914
1915	9,301	94.9	324	3.3	3,482	35.5	1,409	14.4	1,326	13.5	877	9.0	222	2.3	1,661	17.0	1915
1916	9,419	94.9	321	3.2	3,518	35.4	1,411	14.2	1,281	12.9	971	9.8	248	2.5	1,669	16.8	1916
1917	9,736	96.8	327	3.3	3,629	36.1	1,480	14.7	1,297	12.9	975	9.7	240	2.4	1,788	17.8	1917
1918†	9,876	96.9	346	3.4	3,675	36.1	1,535	15.1	1,334	13.1	954	9.4	225	2.2	1,807	17.7	†1918
1919	10,166	98.5	354	3.4	3,700	35.9	1,490	14.4	1,498	14.5	940	9.1	237	2.3	1,947	18.9	1919
1920	10,539	100.8	365	3.5	3,841	36.8	1,569	15.0	1,407	13.5	1,026	9.8	241	2.3	2,090	20.0	1920

* See footnotes of tables 1 and 2, pages 239 and 240.
† Civilian population only, except for New York City.

Table 22 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Deaths by causes, in accordance with the Detailed International List:* 1920

Detailed int. list no.	CAUSES OF DEATH (Detailed International List)	New York State	New York City	Rest of State
	All causes	**144,466**	**73,249**	**71,217**
	I General diseases	**39,828**	**21,664**	**18,164**
1	Typhoid fever	371	137	234
2	Typhus fever	....	....	....
3	Relapsing fever	....	....	....
4	Malaria	17	4	13
5	Smallpox	1	....	1
6	Measles	1,101	736	365
7	Scarlet fever	450	220	230
8	Whooping cough	1,007	615	392
9	Diphtheria and croup	1,904	1,045	859
10	Influenza	5,890	3,492	2,398
11	Miliary fever	....	....	....
12	Asiatic cholera	....	....	....
13	Cholera nostras	8	....	8
14	Dysentery	90	30	60
15	Plague	....	....	....
16	Yellow fever	....	....	....
17	Leprosy	1	1	....
18	Erysipelas	373	203	170
19	Other epidemic diseases	31	23	8
20	Purulent infection and septicemia	154	75	79
21	Glanders	....	....	....
22	Anthrax	6	3	3
23	Rabies	3	1	2
24	Tetanus	71	21	50
25	Mycoses	6	4	2
26	Pellagra	13	3	10
27	Beriberi	1	1	....
	Tuberculosis (total)	12,543	7,135	5,408
28	Tuberculosis of the lungs	10,815	6,165	4,650
29	Acute miliary tuberculosis	215	104	111
30	Tuberculous meningitis	814	509	305
31	Abdominal tuberculosis	300	130	170
32	Pott's disease	114	57	57
33	White swellings	58	35	23
34	Tuberculosis of other organs	148	73	75
35	Disseminated tuberculosis	79	62	17
36	Rickets	72	41	31
37	Syphilis	812	470	342
38	Gonococcus infection	43	32	11
	Cancer and other malignant tumors (total)	10,539	5,317	5,222
39	Of the buccal cavity	365	187	178
40	stomach and liver	3,841	1,986	1,855
41	peritoneum, intestines, rectum	1,569	836	733
42	female genital organs	1,407	643	764
43	breast	1,026	458	568
44	skin	241	74	167
45	other organs, or of organs not specified	2,090	1,133	957
46	Other tumors (tumors of the female genital organs excepted)	33	19	14
47	Acute articular rheumatism	483	236	247
48	Chronic rheumatism and gout	131	48	83
49	Scurvy	10	5	5
50	Diabetes	2,188	1,075	1,113
51	Exophthalmic goiter	181	67	114
52	Addison's disease	41	16	25
53	Leukemia	248	159	89
54	Anemia, chlorosis	628	229	399
55	Other general diseases	172	58	114
56	Alcoholism (acute or chronic)	146	98	48
57	Chronic lead poisoning	14	7	7
58	Other chronic occupation poisonings	3	2	1
59	Other chronic poisonings	43	36	7

Table 22 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Deaths by causes, in accordance with the Detailed International List:* 1920 — (Continued)

Detailed int. list no.	CAUSES OF DEATH (Detailed International List)	New York State	New York City	Rest of State
	II Diseases of the nervous system	**11,048**	**2,560**	**8,488**
60	Encephalitis	235	44	191
61	Meningitis (total)	529	347	182
	A Simple meningitis	339	224	115
	B Cerebrospinal meningitis (undefined)	177	123	54
	C Cerebrospinal fever	13	....	13
62	Locomotor ataxia	216	93	123
63	Other diseases of the spinal cord (total)	543	205	338
	A Acute anterior poliomyelitis	50	40	10
	B Other diseases of the spinal cord	493	165	328
64	Cerebral hemorrhage, apoplexy	6,852	718	6,134
65	Softening of the brain	66	7	59
66	Paralysis without specified cause	358	44	314
67	General paralysis of the insane	798	332	466
68	Other forms of mental alienation	214	112	102
69	Epilepsy	321	118	203
70	Convulsions (nonpuerperal)	2	....	2
71	Convulsions of infants	154	39	115
72	Chorea	23	10	13
73	Neuralgia and neuritis	28	8	20
74	Other diseases of the nervous system	331	191	140
75	Diseases of the eyes and their annexa	7	5	2
76	Diseases of the ears	371	287	84
	III Diseases of the circulatory system	**29,357**	**15,195**	**14,162**
77	Pericarditis	101	50	51
78	Acute endocarditis	961	375	586
79	Organic diseases of the heart	21,696	11,342	10,354
80	Angina pectoris	1,031	350	681
81	Diseases of the arteries, atheroma, aneurism, etc.	4,883	2,824	2,059
82	Embolism and thrombosis	489	140	349
83	Diseases of the veins (varices, hemorrhoids, phlebitis, etc.)	65	29	36
84	Diseases of the lymphatic system (lymphangitis, etc).	111	78	33
85	Hemorrhage, other diseases of the circulatory system.	20	7	13
	IV Diseases of the respiratory system	**19,388**	**11,501**	**7,887**
86	Diseases of the nasal fossae	13	8	5
87	Diseases of the larynx	73	26	47
88	Diseases of the thyroid body	72	40	32
89	Acute bronchitis	1,291	786	505
90	Chronic bronchitis	468	132	336
91	Bronchopneumonia	7,568	4,874	2,694
92	Pneumonia (total)	8,907	5,184	3,723
	A Lobar pneumonia	8,568	5,184	3,384
	B Pneumonia (undefined)	339	....	339
93	Pleurisy	482	222	260
94	Pulmonary congestion, pulmonary apoplexy	144	34	110
95	Gangrene of the lung	25	7	18
96	Asthma	180	94	86
97	Pulmonary emphysema	37	25	12
98	Other diseases of the respiratory system	128	69	59
	V Diseases of the digestive system	**11,583**	**5,960**	**5,623**
99	Diseases of the mouth and annexa	104	45	59
100	Diseases of the pharynx	307	159	148
101	Diseases of the esophagus	23	7	16
102	Ulcer of the stomach	486	242	244
103	Other diseases of the stomach (cancer excepted)	486	117	369
104	Diarrhea and enteritis (under 2 years)	4,662	2,545	2,117
105	Diarrhea and enteritis (2 years and over)	875	381	494
106	Ankylostomiasis	....	....	....
107	Intestinal parasites	5	2	3
108	Appendicitis and typhlitis	1,406	792	614
109	Hernia, intestinal obstruction	1,214	653	561
	A Hernia	480	279	201
	B Intestinal obstruction	734	374	360
110	Other diseases of the intestines	132	73	59

Table 22 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Deaths by causes, in accordance with the Detailed International List:* **1920 — (Continued)**

Detailed int. list no.	CAUSES OF DEATH (Detailed International List)	New York State	New York City	Rest of State
111	Acute yellow atrophy of the liver	38	14	24
112	Hydatid tumor of the liver	3	2	1
113	Cirrhosis of the liver	779	366	413
114	Biliary calculi	365	217	148
115	Other diseases of the liver	464	230	234
116	Diseases of the spleen	15	7	8
117	Simple peritonitis (nonpuerperal)	131	51	80
118	Other diseases of the digestive system (cancer and tuberculosis excepted.)	88	57	31
	VI Nonvenereal diseases of the genitourinary system and annexa	**12,022**	**5,615**	**6,407**
119	Acute nephritis	586	257	329
120	Bright's disease	9,895	4,576	5,319
121	Chyluria	....	....	....
122	Other diseases of the kidneys and annexa	280	130	150
123	Calculi of the urinary passages	65	46	19
124	Diseases of the bladder	147	48	99
125	Diseases of the urethra, urinary abscess, etc	47	34	13
126	Diseases of the prostate	370	169	201
127	Nonvenereal diseases of the male genital organs	15	9	6
128	Uterine hemorrhage (nonpuerperal)	9	....	9
129	Uterine tumor (noncancerous)	264	156	108
130	Other diseases of the uterus	80	42	38
131	Cysts and other tumors of the ovary	93	55	38
132	Salpingitis and other diseases of the female genital organs	160	88	72
133	Nonpuerperal diseases of the breast (cancer excepted)	11	5	6
	VII The puerperal state	**1,424**	**708**	**716**
134	Accidents of pregnancy	195	107	88
135	Puerperal hemorrhage	179	91	88
136	Other accidents of labor	218	110	108
137	Puerperal septicemia	384	174	210
138	Puerperal albuminuria and convulsions	382	190	192
139	Puerperal phlegmasia alba dolens, embolus, sudden death	62	34	28
140	Following childbirth (not otherwise defined)	1	....	1
141	Puerperal diseases of the breast	3	2	1
	VIII Diseases of the skin and of the cellular tissue	**491**	**210**	**281**
142	Gangrene	154	38	116
143	Furuncle	105	56	49
144	Acute abscess	148	83	65
145	Other diseases of the skin and annexa	84	33	51
	IX Diseases of the bones and of the organs of locomotion	**281**	**124**	**157**
146	Diseases of the bones (tuberculosis excepted)	246	106	140
147	Diseases of the joints (tuberculosis and rheumatism excepted)	30	17	13
148	Amputations	2	....	2
149	Other diseases of the organs of locomotion	3	1	2
	X Malformations	**1,363**	**649**	**714**
150	Congenital malformations (stillbirths not included)	1,363	649	714
	A Hydrocephalus	147	86	61
	B Congenital malformations of the heart	794	355	439
	C Other congenital malformations	422	208	214
	XI Early infancy	**7,711**	**4,091**	**3,620**
151	Congenital debility, icterus, and sclerema	5,752	2,982	2,770
	A Premature birth	4,370	2,149	2,221
	B Congenital debility, "atrophy", "marasmus", etc	1,382	833	549

Table 22 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Deaths by causes, in accordance with the Detailed International List:* 1920 — (Concluded)

Detailed int. list no.	CAUSES OF DEATH (Detailed International List)	New York State	New York City	Rest of State
152	Other causes peculiar to early infancy	1,949	1,106	843
	A Injuries at birth	1,080	494	586
	B Other causes peculiar to early infancy	869	612	257
153	Lack of care	10	3	7
	XII Old Age	**838**	**289**	**549**
154	Senility	838	289	549
	XIII External causes	**8,988**	**4,614**	**4,374**
	Suicide	1,189	670	519
155	By poison	142	59	83
156	By asphyxia	317	281	36
157	By hanging or strangulation	247	84	163
158	By drowning	58	20	38
159	By firearms	241	108	133
160	By cutting or piercing instruments	75	35	40
161	By jumping from high places	85	70	15
162	By crushing	17	11	6
163	Other suicides	7	2	5
	Accidental or undefined	7,351	3,619	3,732
164	Poisoning by food	57	13	44
165	Other acute poisonings	162	81	81
166	Conflagration	113	71	42
167	Burns (conflagration excepted)	760	432	328
168	Absorption of deleterious gases (conflagration excepted)	636	504	132
169	Accidental drowning	726	331	395
170	Traumatism by firearms	92	17	75
171	Traumatism by cutting or piercing instruments	37	23	14
172	Traumatism by fall	1,595	760	835
173	Traumatism in mines and quarries	12	....	12
	A Traumatism in mines	10	....	10
	B Traumatism in quarries	2	....	2
174	Traumatism by machines	173	84	89
175	Traumatism by other crushing	2,445	1,074	1,371
	A Railroad accidents and injuries	523	89	434
	B Street car accidents and injuries	154	82	72
	C Automobile accidents and injuries	1,439	763	676
	D Injuries by other vehicles	152	48	104
	E Landslide, other crushing	177	92	85
176	Injuries by animals	51	9	42
177	Starvation	6	....	6
178	Excessive cold	22	4	18
179	Effects of heat	15	11	4
180	Lightning	16	4	12
181	Electricity (lightning excepted)	68	22	46
185	Fractures (cause not specified)	64	45	19
186	Other external violence	301	134	167
	Homicide	448	325	123
182	By firearms	246	177	69
183	By cutting or piercing instruments	53	39	14
184	By other means	149	109	40
	XIV Ill-defined diseases	**144**	**69**	**75**
187	Ill-defined organic diseases	5	....	5
188	Sudden death	1	....	1
189	Not specified or ill-defined	138	69	69

Table 23 — NEW YORK STATE (exclusive of New York City): *Deaths*

Internat. List No.	CAUSE OF DEATH		AGE									
			All ages	Under 1 year	1	2	3	4	Under 5 years	5 to 9	10 to 14	15 to 19
	All causes		71,217	8,986	1,593	751	556	410	12,296	1,313	923	1,328
	Males		36,458	5,164	879	394	276	207	6,920	709	513	702
	Females		34,759	3,822	714	357	280	203	5,376	604	410	626
	I. General diseases		18,164	914	541	341	269	206	2,271	614	354	605
	Males		8,723	518	307	175	138	106	1,244	297	156	257
	Females		9,441	396	234	166	131	100	1,027	317	198	348
1	Typhoid fever	M	137	....	....	2	....	....	2	8	8	15
		F	97	....	1	1	1	2	5	7	7	12
2	Typhus fever	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
3	Relapsing fever	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
4	Malaria	M	9	....	....	1	....	....	1	....	....	....
		F	4	....	....	....	....	....	....	....	....	2
5	Smallpox	M	1	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
6	Measles	M	196	53	65	28	13	9	168	13	2	5
		F	169	39	60	16	12	6	133	17	5	2
7	Scarlet fever	M	114	3	12	10	17	6	48	34	15	6
		F	116	3	11	13	12	13	52	35	7	5
8	Whooping cough	M	182	96	46	16	4	7	169	10	1	1
		F	210	107	47	21	13	7	195	12	2	1
9	Diphtheria and croup	M	448	29	61	63	61	46	260	125	39	8
		F	411	23	33	62	49	45	212	130	33	13
10	Influenza	M	1,217	113	45	14	17	7	196	16	18	55
		F	1,181	68	33	16	22	10	149	27	23	36
11	Miliary fever	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
12	Asiatic cholera	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
13	Cholera nostras	M	6	1	....	1	1	....	3	1	....	....
		F	2	....	....	....	....	1	1	1	....	....
14	Dysentery	M	30	10	1	4	1	1	17	....	....	....
		F	30	4	....	....	....	1	5	....	....	1
15	Plague	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
16	Yellow fever	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
17	Leprosy	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
18	Erysipelas	M	84	20	....	2	....	....	22	3	2	1
		F	86	24	1	....	....	1	26	2	1	2
19	Other epidemic diseases	M	3	1	....	....	....	1	2	1	....	....
		F	5	4	....	1	....	....	5	....	....	....
20	Purulent infection and septicemia	M	37	4	....	....	....	1	5	2	1	....
		F	42	4	1	....	1	....	6	1	1	2
21	Glanders	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
22	Anthrax	M	3	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
23	Rabies	M	2	....	....	....	....	1	1	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
24	Tetanus	M	35	6	....	....	....	2	8	5	8	1
		F	15	1	....	....	....	1	2	2	1	....
25	Mycoses	M	1	....	....	....	....	....	....	....	....	....
		F	1	....	....	....	....	....	....	....	1	....
26	Pellagra	M	1	....	....	....	....	....	....	....	....	....
		F	9	....	....	....	....	....	....	....	....	....
27	Beriberi	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....

by causes, classified by sex, and ages at death (5-year age groups): 1920

Internat. List No.	AGE — (*Continued*) 20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 years and over	Unknown
	1,943	2,476	2,668	2,668	2,660	3,028	3,692	4,227	5,257	5,932	6,256	6,205	4,532	2,657	879	183	25	69
	916	1,214	1,342	1,456	1,490	1,602	1,906	2,191	2,744	3,063	3,075	2,988	2,062	1,109	354	60	9	33
	1,027	1,262	1,326	1,212	1,170	1,426	1,786	2,036	2,413	2,869	3,181	3,217	2,470	1,548	525	123	16	36
	885	1,139	1,142	1,074	1,034	1,091	1,250	1,301	1,402	1,301	1,115	849	440	219	57	9	2	10
	374	582	600	561	542	535	566	587	642	616	505	371	177	82	22	3	1	3
	511	557	542	513	492	556	684	714	760	685	610	478	263	137	35	6	1	7
1	17	16	13	11	7	10	9	8	8	4	....	1	....	....	....	....	....	....
	11	8	8	5	7	4	7	7	4	3	1	1	....	....	....	....	....	....
2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
4	2	....	....	1	....	3	....	1	....	....	1	....	....	....	....	....	....	....
	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
6	1	....	1	2	....	2	....	1	1	....	....	....	....	....	....	....	....	....
	1	1	1	4	2	....	3	....	....	....	....	....	....	....	....	....	....	....
7	2	4	2	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....
	6	5	2	2	1	....	....	1	....	....	....	....	....	....	....	....	....	....
8	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
9	2	3	2	4	1	1	1	....	....	2	....	....	....	....	....	....	....	....
	5	....	2	6	2	1	5	1	1	....	....	....	....	....	....	....	....	....
10	54	130	124	101	73	67	64	64	43	55	49	52	27	21	6	2	....	....
	73	122	120	113	43	48	50	51	46	55	73	73	40	28	8	2	....	1
11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
13	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
14	....	....	....	....	....	....	....	1	1	1	1	4	2	2	....	....	1	....
	....	....	....	....	....	1	2	....	3	2	7	6	1	....	1	1	....	....
15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
16	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
17	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
18	....	2	2	4	3	2	6	5	4	4	9	5	5	4	1	....	....	....
	1	2	2	1	3	8	1	4	6	5	7	4	7	2	2	....	....	....
19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
20	1	1	1	3	1	....	4	4	5	6	1	1	1	....	....	....	....	....
	4	1	1	3	2	5	3	1	2	2	1	4	2	1	....	....	....	....
21	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
22	....	1	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
23	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
24	1	3	....	2	1	....	2	1	1	....	....	2	....	....	....	....	....	....
	....	....	2	2	1	1	1	1	1	1	....	....	....	....	....	....	....	....
25	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....
26	....	....	1	....	2	1	3	1	1	....	....	....	....	....	....	....	....	....
27	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Table 23 — NEW YORK STATE (exclusive of New York City): *Deaths by causes,*

Internat. List No.	CAUSE OF DEATH		AGE									
			All ages	Under 1 year	1	2	3	4	Under 5 years	5 to 9	10 to 14	15 to 19
	I. General diseases — *(Continued)*											
	Tuberculosis	M	2,934	48	55	28	15	14	160	44	28	131
		F	2,474	45	29	31	13	10	128	44	68	237
28	Tuberculosis of the lungs	M	2,560	9	10	4	1	3	27	9	11	118
		F	2,090	10	2	3	3	2	20	14	45	203
29	Acute miliary tuberculosis	M	51	2	2		1	1	6	3	1	2
		F	60	4	1	1		1	7	6	5	10
30	Tuberculous meningitis	M	163	33	36	18	9	7	103	19	10	7
		F	142	25	18	23	7	6	79	17	9	12
31	Abdominal tuberculosis	M	73	3	6	4	2	1	16	7	2	3
		F	97	4	5	3	1		13	4	2	8
32	Pott's disease	M	22			1	1	1	3	2		1
		F	35		1	1			2	2	4	1
33	White swellings	M	19							1	3	
		F	4								1	
34	Tuberculosis of other organs	M	40	1		1	1		3	3	1	
		F	35	2	2				4	1	1	2
35	Disseminated tuberculosis	M	6		1			1	2			
		F	11				2	1	3		1	1
36	Rickets	M	16	12	4				16			
		F	15	5	9			1	15			
37	Syphilis	M	238	68	6				74	2	1	
		F	104	34	3	1			38	2	1	3
38	Gonococcus infection	M	3	3					3			
		F	8	2					2			2
	Cancer and other malignant tumors	M	2,054		3	2	1	2	8	6	6	5
		F	3,168	1	1		1		3	2	2	4
39	Of the buccal cavity	M	150									
		F	28									
40	stomach, liver	M	876							2	1	2
		F	979									
41	peritoneum, intestines, rectum	M	302		1				1		1	1
		F	431	1					1			1
42	female genital organs	F	764									1
43	breast	M	5									
		F	563									
44	skin	M	108							1	1	
		F	59									
45	other organs or of organs not specified	M	613		2	2	1	2	7	3	4	2
		F	344		1		1		2	2	2	2
46	Other tumors (tumors of the female genital organs excepted)	M	4									
		F	10	1					1			
47	Acute articular rheumatism	M	112	2	1		2	2	7	10	12	10
		F	135	2	1				3	14	27	10
48	Chronic rheumatism and gout	M	30									
		F	53									
49	Scurvy	M	4	4					4			
		F	1	1					1			
50	Diabetes	M	505	1	2	1	4	4	12	13	12	15
		F	608	1	1	1	3		6	10	14	7
51	Exophthalmic goiter	M	12									
		F	102							1		4
52	Addison's disease	M	10									
		F	15									
53	Leukemia	M	42	3		1	1	2	7	2	1	2
		F	47	2	1		2		5	5	2	2
54	Anemia, chlorosis	M	139	4	3	1	1		9			
		F	260	2	1	1	1	1	6	2	2	3
55	Other general diseases	M	61	37	3	1		1	42	2	2	1
		F	53	23	1	2	1	1	28	3	1	1
56	Alcoholism (acute or chronic)	M	42									1
		F	6									

classified by sex, and ages at death (5-year age groups): 1920 — (Continued)

Internat. No.	Age — (Continued) 20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 years and over	Unknown
	270	377	376	329	303	250	206	163	118	88	49	28	8	4	1	....	....	1
	365	360	297	223	167	137	116	81	85	68	44	28	11	11	1	....	....	3
28	251	344	352	311	283	231	194	152	111	80	46	27	8	3	1	....	....	1
	322	327	273	207	156	120	106	71	75	62	41	25	9	10	1	....	....	3
29	5	10	8	6	2	2	1	1	2	1	1	....	....	....	....	....	....	....
	11	7	3	2	2	2	1	1	1	1	....	....	1	....	....	....	....	....
30	2	6	4	2	2	6	....	1	....	1	....	....	....	....	....	....	....	....
	10	5	4	2	....	2	1	1	....	....	....	....	....	....	....	....	....	....
31	3	6	5	4	8	3	5	5	3	1	1	1	....	....	....	....	....	....
	14	14	9	6	2	6	4	5	4	3	2	1	....	....	....	....	....	....
32	2	4	1	1	....	3	1	2	1	1	....	....	....	....	....	....	....	....
	4	2	4	3	4	3	....	2	....	2	1	1	....	....	....	....	....	....
33	1	1	1	3	1	3	2	2	....	....	1	....	....	....	....	....	....	....
	1	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
34	5	6	3	2	7	2	3	....	1	3	....	....	....	1	....	....	....	....
	2	3	3	3	3	2	3	1	5	....	....	....	1	1	....	....	....	....
35	1	....	2	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
	1	1	1	....	....	1	1	....	....	....	....	1	....	....	....	....	....	....
36	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
37	3	11	12	21	29	25	20	13	13	7	4	1	1	....	....	....	....	1
	3	3	7	9	10	4	8	8	4	3	....	1	....	....	....	....	....	....
38	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	1	2	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	6	13	31	45	76	115	169	254	325	329	306	206	105	38	9	1	....	1
	13	26	59	102	197	261	366	419	436	425	327	274	155	72	21	2	....	2
39	....	....	2	1	6	9	17	18	26	18	20	20	8	4	1	....	....	....
	....	....	....	1	3	....	1	4	4	3	....	7	3	1	1	....	....	....
40	1	2	7	17	36	53	74	134	151	136	133	84	32	8	2	....	....	1
	1	5	5	11	40	61	92	130	150	167	183	103	55	21	3	....	....	2
41	1	3	4	11	11	15	29	36	56	43	47	28	12	3	1	....	....	....
	2	3	8	12	21	22	45	51	69	68	48	45	24	11	....	....	....	....
42	6	10	25	44	72	95	95	110	96	79	61	39	21	10	....	....	....	....
43	....	....	....	....	1	....	....	....	....	1	2	1	....	....	....	....	....	....
	1	4	13	23	41	49	82	77	64	61	49	44	29	14	11	1	....	....
44	....	....	....	....	2	2	3	4	13	19	14	14	16	14	4	1	....	....
	1	....	....	1	2	1	1	4	4	4	9	10	10	8	4	....	....	....
45	4	8	18	16	20	36	46	62	79	112	90	59	37	9	1	....	....	....
	2	4	8	10	18	33	50	43	49	43	27	26	13	7	2	1	....	....
46	....	....	....	1	....	....	2	....	....	....	....	....	1	....	....	....	....	....
	....	....	....	1	....	2	1	....	....	2	....	1	1	1	....	....	....	....
47	2	6	5	4	3	7	7	7	7	8	10	5	2	....	....	....	....	....
	4	6	7	5	1	7	9	6	9	5	9	6	5	2	....	....	....	....
48	....	....	....	....	1	....	2	1	4	4	8	5	4	1	....	....	....	....
	1	....	3	1	2	1	1	6	6	6	9	9	5	1	2	....	....	....
49	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
50	11	10	17	17	20	18	45	37	85	70	49	47	17	7	3	....	....	....
	10	10	11	10	20	32	55	74	97	78	97	42	22	12	....	....	....	1
51	....	....	2	....	1	5	....	1	1	....	2	....	....	....	....	....	....	....
	7	3	8	8	13	10	15	9	11	5	3	4	1	....	....	....	....	....
52	....	1	....	....	2	2	1	2	1	1	....	....	....	....	....	....	....	....
	....	....	....	3	1	1	2	1	3	1	1	....	2	....	....	....	....	....
53	1	2	1	1	3	8	1	2	4	5	1	1	....	....	....	....	....	....
	1	1	3	....	3	4	1	4	5	3	5	....	3	....	....	....	....	....
54	....	....	4	5	11	9	16	15	17	24	12	9	3	3	2	....	....	....
	4	4	7	12	11	24	29	37	86	20	26	24	7	5	....	1	1	....
55	1	1	2	2	....	....	1	1	1	2	....	2	....	1	....	....	....	....
	....	1	....	1	1	2	5	2	4	1	....	....	1	2	....	....	....	....
56	....	1	4	4	5	7	7	4	2	4	2	1	....	....	....	....	....	....
	....	1	1	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....

Table 23 — NEW YORK STATE (exclusive of New York City): *Deaths by causes,*

Internat. List No.	CAUSE OF DEATH		AGE: All ages	Under 1 year	1	2	3	4	Under 5 years	5 to 9	10 to 14	15 to 19
	I. General diseases — (*Concluded*)											
57	Chronic lead poisoning	M	7	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
58	Other chronic occupation poisonings	M	1	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
59	Other chronic poisonings	M	3	....	....	....	....	....	....	....	....	....
		F	4	....	....	....	....	....	....	....	....	....
	II. Diseases of the nervous system and of the organs of special sense		8,488	223	66	21	28	15	353	62	63	51
	Males		4,181	137	36	11	16	9	209	35	33	30
	Females		4,307	86	30	10	12	6	144	27	30	21
60	Encephalitis	M	94	5	3	2	3	3	16	6	3	8
		F	97	6	5	1	1	3	16	6	7	4
61	Meningitis	M	112	29	9	5	5	2	50	9	11	2
		F	70	12	11	5	5	1	34	8	7	3
	Simple meningitis	M	73	18	5	5	4	....	32	5	6	2
		F	42	8	6	1	3	1	19	5	3	1
	Cerebrospinal meningitis (undefined)	M	29	9	4	....	1	2	16	2	4	....
		F	25	4	5	4	1	....	14	3	3	2
	Cerebrospinal fever	M	10	2	....	....	....	....	2	2	1	....
		F	3	....	....	....	1	....	1	....	1	....
62	Locomotor ataxia	M	90	....	....	....	....	....	....	....	....	....
		F	33	....	....	....	....	....	....	....	....	....
63	Other diseases of the spinal cord	M	165	4	2	1	....	....	7	1	1	6
		F	173	1	2	1	1	....	5	....	2	1
	Acute anterior poliomyelitis	M	4	1	1	1	....	....	3	1	....	....
		F	6	1	2	1	....	....	4	....	2	....
	Other diseases of the spinal cord	M	161	3	1	....	....	....	4	....	1	6
		F	167	....	....	....	1	....	1	....	....	1
64	Cerebral hemorrhage, apoplexy	M	2,806	25	2	1	....	....	28	3	3	1
		F	3,328	13	3	1	....	....	17	1	1	2
65	Softening of the brain	M	29	....	....	....	....	....	....	....	....	....
		F	30	....	....	....	....	....	....	....	....	....
66	Paralysis without specified cause	M	147	2	....	....	....	....	2	1	....	1
		F	167	2	....	....	....	....	2	....	2	....
67	General paralysis of the insane	M	374	....	....	....	....	....	....	....	....	....
		F	92	....	....	....	....	....	....	....	....	....
68	Other forms of mental alienation	M	39	....	....	....	....	....	....	....	....	3
		F	63	....	....	....	....	....	....	....	....	....
69	Epilepsy	M	108	2	1	1	2	....	6	2	6	8
		F	95	3	1	....	1	1	6	4	5	5
70	Convulsions (nonpuerperal)	M	2	....	....	....	....	....	....	1	1	....
		F	....	....	....	....	....	....	....	....	....	....
71	Convulsions of infants	M	69	55	11	....	3	....	69	....	....	....
		F	46	36	7	1	1	1	46	....	....	....
72	Chorea	M	7	1	1	....	....	....	2	....	....	....
		F	6	....	....	....	....	....	....	....	1	3
73	Neuralgia and neuritis	M	11	....	....	....	....	....	....	....	....	....
		F	9	....	....	....	....	....	....	....	....	....
74	Other diseases of the nervous system	M	78	5	2	1	1	2	11	4	5	1
		F	62	3	....	....	2	....	5	4	3	2
75	Diseases of the eyes and their annexa	M	1	....	....	....	....	....	....	....	....	....
		F	1	....	1	....	....	....	1	....	....	....
76	Diseases of the ears	M	49	9	5	....	2	2	18	8	3	....
		F	35	10	....	1	1	....	12	4	2	1
	III. Diseases of the circulatory system		14,162	129	23	14	11	12	189	67	98	90
	Males		7,094	93	12	6	7	7	125	29	54	46
	Females		7,068	36	11	8	4	5	64	38	44	44
77	Pericarditis	M	32	2	....	....	....	....	2	....	2	2
		F	19	1	....	....	....	....	1	1	1	....

assified by sex, and ages at death (5-year age groups): 1920 — (Continued)

AGE — (Continued)

	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99
	.....	.....	.....	1	1	2	.....	.....	1	1	.....	.....	.....	1	.....	
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	.....	.....	.....	1	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	
	1	1	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	
	67	97	142	198	276	350	490	664	864	1,056	1,159	1,152	824	455	128	2
	34	47	87	127	167	177	259	342	451	532	536	517	363	170	50	
	33	50	55	71	109	173	231	322	413	524	623	635	461	285	78	1
	4	7	5	11	10	3	6	5	2	3	3	.....	1	1	.....	
	9	4	10	4	3	11	10	3	4	2	.....	2	1	1	.....	
	5	2	4	8	3	4	7	2	3	.....	1	.....	1	.....	.....	
	1	4	2	1	1	2	2	1	1	.....	1	1	.....	.....	1	
	3	1	4	5	3	3	5	1	1	.....	1	.....	1	.....	.....	
	1	3	1	1	1	2	2	.....	1	.....	.....	1	.....	.....	1	
	2	1	.....	1	.....	1	.....	1	1	.....	.....	.....	.....	.....	.....	
	.....	1	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	
	.....	.....	.....	2	.....	.....	2	.....	1	.....	.....	.....	.....	.....	.....	
	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	
	.....	.....	1	3	7	9	13	16	12	16	5	6	2	.....	.....	
12	1	1	1	1	2	3	5	1	7	5	3	1	2	.....	.....	
	.....	3	5	4	4	6	6	18	26	27	19	19	11	2	.....	
13	4	2	6	6	10	9	18	19	22	16	21	15	13	3	1	
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	.....	3	5	4	4	6	6	18	26	27	19	19	11	2	.....	
	4	2	6	6	10	9	18	19	22	16	21	15	13	3	1	
	4	12	15	13	49	69	145	232	345	437	475	451	314	149	46	
	2	6	13	26	63	100	155	263	347	463	558	555	406	254	74	1
	.....	1	.....	.....	.....	1	1	2	3	3	2	4	5	6	1	
64	.....	.....	.....	1	1	.....	.....	.....	5	2	3	10	5	3	.....	
	.....	.....	.....	3	2	4	8	12	20	19	18	27	17	11	2	
	1	.....	.....	1	4	2	6	9	11	20	28	41	21	18	1	
	3	6	30	65	69	61	57	37	25	10	4	4	3	.....	.....	
65	1	8	9	10	11	18	12	14	3	2	.....	1	2	1	.....	
66	1	4	4	2	4	2	3	4	4	1	4	.....	2	.....	1	
	2	7	4	5	5	6	8	5	6	4	4	1	4	2	.....	
67	8	7	16	10	9	6	3	9	2	8	2	2	4	.....	.....	
	8	11	5	7	3	9	10	3	4	6	2	5	2	.....	.....	
68	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
69	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	.....	1	.....	.....	.....	1	.....	.....	1	.....	1	1	.....	.....	.....	
	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
71	1	.....	1	.....	1	1	1	.....	.....	1	2	1	2	.....	.....	
	1	.....	.....	1	.....	2	.....	.....	.....	1	.....	1	1	2	.....	
72	7	3	4	7	8	6	9	4	4	3	.....	2	.....	.....	.....	
73	1	6	4	5	4	8	4	8	2	2	3	1	3	1	1	
	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
74	1	1	2	.....	1	4	.....	1	4	4	.....	.....	1	1	.....	
75	1	1	1	3	1	3	1	1	1	1	.....	1	1	.....	.....	
76	117	131	196	225	317	449	685	896	1,346	1,746	2,080	2,276	1,802	1,018	346	6
	45	50	93	123	166	227	352	482	730	905	1,054	1,142	858	447	143	1
	72	81	103	102	151	222	333	414	616	841	1,026	1,134	944	571	203	5
	1	2	1	2	1	3	1	.....	1	3	3	5	.....	2	1	
77	.....	1	.....	2	1	2	.....	.....	1	.....	4	.....	4	1	.....	

Table 23 — NEW YORK STATE (exclusive of New York City): *Deaths by causes,*

Internat. List No.	CAUSE OF DEATH		Age									
			All ages	Under 1 year	1	2	3	4	Under 5 years	5 to 9	10 to 14	15 to 19
	II. Diseases of the circulatory system—(*Con'ld*)											
78	Acute endocarditis	M	289	24	4	2	....	2	32	7	13	11
		F	297	11	3	2	2	3	21	11	12	6
79	Organic diseases of the heart	M	5,037	58	5	3	5	4	75	19	38	33
		F	5,317	12	6	5	2	2	27	25	30	37
80	Angina pectoris	M	431	....	....	....	....	....	....	....	....	....
81	Diseases of the arteries, atheroma, aneu-	F	250	....	....	....	....	....	....	....	....	....
	rism, etc	M	1,115	....	....	....	1	....	1	....	....	....
		F	944	....	....	....	....	....	....	....	....	....
82	Embolism and thrombosis	M	161	1	....	....	....	....	1	1	1	....
		F	188	2	1	....	....	....	3	....	1	1
83	Diseases of the veins (varices, hem-											
	orrhoids, phlebitis, etc.)	M	7	....	....	....	....	....	....	....	....	....
84	Diseases of the lymphatic system (lym-	F	29	....	....	....	....	....	....	....	....	....
	phangitis, etc.)	M	16	8	2	1	1	1	13	2	....	....
85	Hemorrhage; other diseases of the cir-	F	17	9	1	1	....	....	11	1	....	....
	culatory system	M	6	....	1	....	....	....	1	....	....	....
		F	7	1	....	....	....	....	1	....	....	....
	IV. Diseases of the respiratory system		7,887	1,190	442	167	87	69	1,955	146	100	146
	Males		4,083	696	220	90	39	35	1,080	75	53	93
	Females		3,804	494	222	77	48	34	875	71	47	53
86	Diseases of the nasal fossae	M	3	2	....	....	....	....	2	....	....	....
		F	2	....	1	....	....	....	1	....	....	1
87	Diseases of the larynx	M	26	8	5	....	1	3	17	3	1	....
		F	21	5	3	2	1	1	12	4	....	....
88	Diseases of the thyroid body	M	3	....	....	....	....	....	....	1	....	....
		F	29	....	....	....	....	....	....	....	1	....
89	Acute bronchitis	M	240	130	24	10	1	3	168	3	1	1
		F	265	116	24	6	2	....	148	5	....	....
90	Chronic bronchitis	M	158	3	1	....	1	....	5	1	....	....
		F	183	1	....	....	....	....	1	....	....	....
91	Bronchopneumonia	M	1,352	430	129	53	23	11	646	28	15	18
		F	1,342	290	127	42	27	19	505	33	18	15
92	Pneumonia	M	1,990	103	52	18	11	15	199	30	31	69
		F	1,738	69	59	23	15	13	179	24	29	34
	Lobar pneumonia	M	1,813	86	43	16	9	13	167	29	27	65
		F	1,571	58	51	20	14	12	155	20	26	30
	Pneumonia (undefined)	M	177	17	9	2	2	2	32	1	4	4
		F	162	11	8	3	1	1	24	4	3	4
93	Pleurisy	M	165	10	6	7	2	3	28	6	4	3
94	Pulmonary congestion, pulmonary	F	95	8	7	4	3	....	22	4	3	2
	apoplexy	M	58	7	2	....	....	....	9	1	....	....
		F	57	5	1	....	....	....	6	....	1	....
95	Gangrene of the lung	M	13	....	....	....	....	....	....	....	....	....
		F	5	....	....	....	....	....	....	....	....	....
96	Asthma	M	46	....	1	1	....	....	2	....	1	....
		F	40	....	....	....	....	1	1	1	....	....
97	Pulmonary emphysema	M	6	....	....	....	....	....	....	....	....	....
98	Other diseases of the respiratory system	F	6	....	....	....	....	....	....	....	....	....
	(tuberculosis excepted)	M	33	3	....	1	....	....	4	2	....	2
		F	26	....	....	....	....	....	....	....	....	1
	V. Diseases of the digestive system		5,623	1,992	393	113	68	39	2,605	137	70	88
	Males		3,038	1,132	224	62	37	22	1,477	71	36	51
	Females		2,585	860	169	51	31	17	1,128	66	34	37
99	Diseases of the mouth and annexa	M	34	7	1	....	....	....	8	2	1	3
		F	25	5	1	1	2	1	10	....	....	2
100	Diseases of the pharynx	M	75	4	5	6	4	3	22	11	2	5
		F	73	5	3	3	3	1	15	9	4	3
101	Diseases of the esophagus	M	7	1	....	....	....	....	1	....	....	....
		F	9	....	....	....	....	....	....	1	....	....

classified by sex, and ages at death (5-year age groups): 1920 — (Continued)

Internat. List No.	AGE — (Continued) 20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 years and over	Unknown
78	11	8	18	23	21	34	38	41	11	5	6	7	1	2	....	....	....	....
	18	17	21	10	22	24	41	37	11	9	7	15	6	7	2	....	....	....
79	32	35	63	74	124	147	233	327	549	683	789	816	621	288	77	8	3	3
	50	60	76	80	109	167	247	317	507	687	811	845	604	386	130	22	5	5
80	....	1	4	17	10	19	39	58	70	78	53	48	22	9	3	....	....	....
	1	....	1	2	6	8	19	18	37	42	43	44	21	4	4	....	....	....
81	1	2	2	2	7	14	25	46	73	117	176	241	200	141	58	8	1	....
	....	1	....	1	4	12	12	24	38	72	137	200	192	157	62	27	2	3
82	....	2	5	4	2	8	15	9	22	18	26	25	18	5	4	....	....	....
	3	2	4	4	6	8	10	12	14	25	20	28	26	15	5	1	....	....
83	....	....	....	1	1	1	1	....	3	....	....	....	....	....	....	....	....	....
	....	....	1	3	2	1	4	3	4	5	3	1	1	1	....	....	....	....
84	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	1	....	....	1	1	....	1	1	....	....	....	....	....	....
85	....	....	....	....	....	....	....	1	1	1	1	....	1	....	....	....	....	....
	....	....	....	....	....	....	....	2	3	1	....	....	....	....	....	....	....	....
	258	388	446	374	306	322	344	369	446	481	524	504	412	247	94	15	3	7
	130	194	221	212	194	179	194	200	241	255	236	228	152	106	32	3	2	3
	128	194	225	162	112	143	150	169	205	226	288	276	260	141	62	12	1	4
86	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
87	....	....	1	....	....	1	....	....	2	1	....	....	....	....	....	....	....	....
	....	....	1	....	1	....	....	1	....	1	....	....	1	....	....	....	....	....
88	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....
	....	1	3	3	1	3	5	6	1	2	2	1	....	....	....	....	....	....
89	....	....	2	4	3	....	3	1	2	5	7	13	12	11	4	....	....	....
	2	2	1	....	2	5	3	6	6	4	13	21	21	15	8	1	1	1
90	....	....	1	2	3	4	3	9	15	20	14	27	23	21	4	....	1	....
	1	1	....	3	3	4	4	2	8	10	31	36	32	28	15	4	....	....
91	26	36	40	31	36	23	39	43	62	66	67	68	60	36	9	1	....	2
	26	38	50	34	32	38	32	33	60	77	86	100	87	53	25	3	....	2
92	92	140	167	159	139	128	132	122	137	143	132	99	43	22	5	....	....	1
	93	141	158	111	65	83	91	110	114	115	143	101	95	34	10	2	....	1
	80	135	158	152	132	114	116	114	127	127	119	89	40	18	3	....	....	1
	90	132	151	103	59	79	80	101	101	106	126	93	78	29	9	2	....	1
	12	5	9	7	7	14	16	8	10	16	13	10	3	4	2	....	....	....
	3	9	7	8	6	4	11	9	13	9	17	8	17	5	1	....	....	....
93	6	12	4	12	8	17	8	12	14	8	8	9	4	1	1	....	....	....
	3	3	4	7	3	4	7	3	7	4	6	9	3	....	1	....	....	....
94	....	1	....	....	....	1	1	5	1	3	1	5	5	10	7	2	1	....
	....	1	1	1	....	....	1	2	2	5	2	4	17	9	3	2	....	....
95	2	3	1	....	....	....	3	2	1	1	....	....	....	....	....	....	....	....
	....	....	3	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....
96	....	....	1	....	3	2	2	5	8	6	5	6	4	5	1	....	....	....
	....	2	1	1	....	2	6	6	4	4	5	3	4	....	....	....	....	....
97	....	1	....	....	....	....	1	....	2	1	1	....	....	....	....	....	....	....
	....	....	....	....	1	2	....	....	1	1	....	....	....	1	....	....	....	....
98	4	1	4	4	2	2	2	1	2	1	....	1	1	....	....	....	....	....
	3	5	3	2	4	1	1	....	2	2	....	1	....	1	....	....	....	....
	105	135	131	167	152	222	239	229	292	290	275	222	149	87	22	5	....	1
	58	64	66	94	83	121	127	134	153	154	142	94	60	43	7	2	....	1
	47	71	65	73	69	101	112	95	139	136	133	128	89	44	15	3	....	....
99	....	1	1	1	1	1	3	4	3	1	1	2	1	....	....	....	....	....
	....	3	....	1	2	1	1	1	2	....	....	1	1	....	....	....	....	....
100	4	4	4	1	2	4	6	1	1	2	1	1	2	1	....	1	....	....
	5	3	7	3	6	2	2	2	1	1	2	4	3	1	....	....	....	....
101	....	....	....	....	....	1	1	1	1	....	2	....	....	....	....	....	....	....
	....	....	....	2	....	....	1	....	2	1	....	2	....	....	....	....	....	....

Table 23 — NEW YORK STATE (exclusive of New York City): *Deaths by causes,*

Internat. List No.	CAUSE OF DEATH		AGE: All ages	Under 1 year	1	2	3	4	Under 5 years	5 to 9	10 to 14	15 to 19
	V. Diseases of the digestive system — (*Conc.*)											
102	Ulcer of the stomach	M	145	1	....	....	....	....	1	....	1	1
		F	99	2	....	....	....	....	2	1	....	2
103	Other diseases of the stomach (cancer excepted)	M	208	69	6	4	7	....	86	4	....	....
		F	161	43	4	1	2	1	51	2	....	2
104	Diarrhea and enteritis (under 2 years)	M	1,187	992	195	....	....	....	1,187	....	....	....
		F	930	781	149	....	....	....	930	....	....	....
105	Diarrhea and enteritis (2 years and over)	M	239	....	....	44	20	14	78	17	8	8
		F	255	....	....	43	18	9	70	17	3	2
106	Ankylostomiasis	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
107	Intestinal parasites	M	1	....	....	....	....	....	....	....	....	....
		F	2	....	1	....	....	....	1	1	....	....
108	Appendicitis and typhlitis	M	347	2	3	2	3	4	14	25	20	28
		F	267	....	2	....	3	3	8	25	22	18
109	Hernia, intestinal obstruction	M	292	44	6	5	2	1	58	6	3	7
		F	269	18	5	1	1	2	27	2	....	2
	Hernia	M	97	9	2	1	....	....	12	....	....	2
		F	104	2	....	....	....	....	2	....	....	1
	Intestinal obstruction	M	195	35	4	4	2	1	46	6	3	5
		F	165	16	5	1	1	2	25	2	....	1
110	Other diseases of the intestines	M	38	6	1	....	1	....	8	2	....	2
		F	21	2	1	1	1	....	5	....	....	....
111	Acute yellow atrophy of the liver	M	6	....	....	....	....	....	....	....	....	1
		F	18	1	....	....	....	....	1	....	....	1
112	Hydatid tumor of the liver	M	1	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
113	Cirrhosis of the liver	M	264	....	1	....	....	....	1	1	....	....
		F	149	....	2	....	....	....	2	....	1	....
114	Biliary calculi	M	39	....	....	....	....	....	....	....	....	....
		F	109	....	....	....	....	....	....	....	....	....
115	Other diseases of the liver	M	99	3	1	....	....	....	4	1	1	1
		F	135	1	....	....	....	....	1	....	2	2
116	Diseases of the spleen	M	5	....	....	....	....	....	....	....	....	....
		F	3	....	....	....	....	....	....	....	....	....
117	Simple peritonitis (nonpuerperal)	M	37	3	5	1	....	....	9	2	....	....
		F	43	2	1	1	1	....	5	8	2	2
118	Other diseases of the digestive system (cancer and tuberculosis excepted)	M	14	....	....	....	....	....	....	....	....	....
		F	17	....	....	....	....	....	....	....	....	1
	VI. Nonvenereal diseases of the genitourinary system and annexa		6,407	54	19	12	8	9	102	37	39	47
	Males		3,258	33	13	5	4	4	59	20	20	22
	Females		3,149	21	6	7	4	5	43	17	19	25
119	Acute nephritis	M	155	17	6	2	2	3	30	9	7	5
		F	174	10	2	7	2	2	23	9	11	2
120	Bright's disease	M	2,698	4	3	2	2	1	12	10	12	15
		F	2,621	3	4	....	2	3	12	5	8	12
121	Chyluria	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
122	Other diseases of the kidneys and annexa	M	88	9	3	1	....	....	13	....	....	1
		F	62	6	....	....	....	....	6	3	....	....
123	Calculi of the urinary passages	M	13	....	....	....	....	....	....	....	....	1
		F	6	....	....	....	....	....	....	....	....	....
124	Diseases of the bladder	M	82	....	1	....	....	....	1	1	1	....
		F	17	....	....	....	....	....	....	....	....	....
125	Diseases of the urethra, urinary abscess, etc	M	18	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
126	Diseases of the prostate	M	201	....	....	....	....	....	....	....	....	....
127	Nonvenereal diseases of the male genital organs	M	6	2	....	....	....	....	2	....	....	....
128	Uterine hemorrhage (nonpuerperal)	F	9	....	....	....	....	....	....	....	....	2
129	Uterine tumor (noncancerous)	F	108	....	....	....	....	....	....	....	....	....

Classified by sex, and age at death (5-year age groups): 1920 — (Continued)

Intermat. List No.	Age — (Continued) 20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99
	3	5	6	8	10	19	17	17	12	19	9	11	5	1		
	2	5	4	7	5	4	11	8	8	9	8	13	5	3	2	
	2	1	3	4	4	5	7	15	16	17	15	9	12	5	3	
	3	3	1	1	3	2	5	4	10	16	18	12	16	10	2	
	2	7	3	7	10	11	7	11	14	12	16	10	12	9	1	1
		8	6	5	3	13	6	10	18	11	17	18	26	17	4	1
		1														
	32	24	33	35	22	33	27	14	18	9	6	4	2			
	26	30	22	25	13	18	20	11	14	10	2	1	2			
	7	7	8	10	6	17	14	18	26	26	34	20	11	13	1	
	3	5	7	10	10	19	20	18	26	36	27	36	12	5	3	1
110		2	3	3	2	2	6	7	8	15	13	9	4	8	1	
			3	4	2	5	6	9	11	20	14	17	6	2	2	
	7	5	5	7	4	15	8	11	18	11	21	11	7	5		
	3	5	4	6	8	14	14	9	15	16	13	19	6	3	1	1
	1	2	1	1	2	2		3	2	4	3	3		1	1	
	1	1	1	1	1	1	2	2		1	2	2			1	
111						1	1		1	1					1	
		3	3			1	2	1	2		1		2	1		
									1							
112																
113	1	4	4	13	16	15	26	30	39	43	34	22	9	6		
			3	3	5	13	13	7	22	22	26	17	9	3	3	
114	1			1	1	2	6	8	5	6	3	4	1	1		
		3	3	7	10	8	17	13	15	12	10	9	2			
	1	4	3	9	7	6	5	7	11	13	13	4	4	5		
	6	5	6	3	8	11	7	11	15	14	17	12	10	4		1
		1				2	1		1							
							1	1			1					
115																
116	4	3		1		2	4	2	1	1	4	2	1	1		
	1	2	1	4		6	2	3	3	2	1		1			
				3	2		2	3	1		1	2				
			1	1	3	2	2	3	1	1	1	1				
117																
118	74	94	147	190	258	340	425	517	662	788	848	859	563	307	85	15
	26	33	47	70	120	156	203	259	361	429	449	465	313	155	41	10
	48	61	100	120	138	184	222	258	301	359	399	394	250	152	44	5
	4	7	8	4	14	14	6	9	10	10	4	8	4	2		
	13	6	8	9	17	12	14	12	13	6	8	1	5	4	1	
	18	24	35	53	96	131	179	232	313	379	390	388	245	122	36	8
	16	30	58	60	79	130	186	230	270	342	373	378	234	142	42	5
119																
120	3	1	2	7	7	7	7	4	8	3	7	9	4	5		
	1	5	5	7	2	4	2	5	7	3	7	2	3			
121				1				2	4	2		2			1	
122						1	1		1	1	2					
		1		3		3	1	2	3	6	9	17	23	6	3	2
123	1				1	1			2		2	6	2	1		
124			2	1		1	3	2		2	2					
125	1				3		5	8	23	26	37	41	36	20	1	
126							2			1			1			
127		2	1		1	1										
128	2	3	5	22	25	22	13	2	3	1	4	2	2	4		
129																

Table 23 — New York State (exclusive of New York City): *Deaths by causes,*

Internat. List No.	CAUSE OF DEATH		Age: All ages	Under 1 year	1	2	3	4	Under 5 years	5 to 9	10 to 14	15 to 19
	VI. Nonvenereal diseases of the genitourinary system and annexa — (*Concluded*)											
130	Other diseases of the uterus	F	38									1
131	Cysts and other tumors of the ovary	F	38									1
132	Salpingitis and other diseases of the female genital organs	F	72	1					1			7
133	Nonpuerperal diseases of the breast (cancer excepted)	M	2	1					1			
		F	4	1					1			
	VII. The puerperal state		716									44
134	Accidents of pregnancy	F	88									3
135	Puerperal hemorrhage	F	88									2
136	Other accidents of labor	F	108									2
137	Puerperal septicemia	F	210									14
138	Puerperal albuminuria and convulsions	F	192									22
139	Puerperal phlegmasia alba dolens, embolus, sudden death	F	28									1
140	Following childbirth (not otherwise defined)	F	1									
141	Puerperal diseases of the breast	F	1									
	VIII. Diseases of the skin and of the cellular tissue		281	56	5	3	2		66	2	1	7
	Males		143	27	2	1			30	2	1	2
	Females		138	29	3	2	2		36			5
142	Gangrene	M	62	2					2	1		
		F	54	2	2				4			
143	Furuncle	M	30	7	1				8			1
		F	19	9					9			1
144	Acute abscess	M	31	5	1	1			7		1	1
		F	34	9	1	2	1		13			2
145	Other diseases of the skin and annexa	M	20	13					13	1		
		F	31	9			1		10			1
	IX. Diseases of the bones and of the organs of locomotion		157	13			4	5	22	18	13	9
	Males		92	8			3	3	14	8	9	8
	Females		65	5			1	2	8	10	4	1
146	Diseases of the bones (tuberculosis excepted)	M	86	8			3	3	14	8	9	8
		F	54	4			1	2	7	10	4	
147	Diseases of the joints (tuberculosis and rheumatism excepted)	M	4									
		F	9									
148	Amputations	M	2									
		F										
149	Other diseases of the organs of locomotion	M										
		F	2	1					1			
	X. Malformations		714	693	12	3	1	1	710	3	1	
	Males		396	382	8	2		1	393	2	1	
	Females		318	311	4	1	1		317	1		
150	Congenital malformations (stillbirths not included)	M	396	382	8	2		1	393	2	1	
		F	318	311	4	1	1		317	1		
	Hydrocephalus	M	30	26	1	1		1	29	1		
		F	31	29	1	1			31			
	Congenital malformations of the heart	M	254	247	5	1			253		1	
		F	185	181	3				184	1		
	Other congenital malformations	M	112	109	2				111	1		
		F	102	101			1		102			

classified by sex, and age at death (5-year age groups): 1920 — (Continued)

Internat. List No.	Age — (Continued) 20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 years and over	Unknown
130	3	5	7	3	3	4	1	6	1	1	....	2	....	....	1	....	....	....
131	....	....	3	3	2	5	3	3	4	5	4	1	4	....	....	....	....	....
132	12	10	13	16	8	3	2	....	....	....	....	....	....	....	....	....	....	....
133	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	1	....	....	1	....	....	....	....	1	....	....	....	....
	134	186	181	122	48	1	....	....	....	....	....	....	....	....	....	....	....	....
134	15	19	34	13	4	....	....	....	....	....	....	....	....	....	....	....	....	....
135	9	25	23	24	5	....	....	....	....	....	....	....	....	....	....	....	....	....
136	19	31	32	16	8	....	....	....	....	....	....	....	....	....	....	....	....	....
137	51	56	45	31	12	1	....	....	....	....	....	....	....	....	....	....	....	....
138	37	47	41	31	14	....	....	....	....	....	....	....	....	....	....	....	....	....
139	3	7	5	7	5	....	....	....	....	....	....	....	....	....	....	....	....	....
140	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
141	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	3	5	6	5	12	7	7	15	16	16	15	42	28	14	9	3	1	1
	....	2	3	4	8	2	2	6	11	5	10	27	15	7	5	1	....	....
	3	3	3	1	4	5	5	9	5	11	5	15	13	7	4	2	1	1
142	....	....	1	1	1	....	1	4	3	8	5	17	11	6	5	1	....	....
	....	1	....	....	....	3	....	3	1	6	5	13	9	3	3	1	1	1
143	....	1	2	....	5	....	1	1	4	1	2	2	2	....	....	....	....	....
	1	....	1	1	....	....	1	....	....	2	....	....	3	....	....	....	....	....
144	....	1	....	3	2	2	....	1	3	1	1	6	1	1	....	....	....	....
	2	1	1	....	2	1	1	4	2	1	....	1	....	1	....	1	....	....
145	....	....	....	....	....	....	....	....	1	....	2	2	1	....	....	....	....	....
	....	1	1	....	2	1	3	2	2	2	....	1	1	3	1	....	....	....
	10	8	9	10	10	4	12	5	8	10	1	2	4	1	1	....	....	....
	7	4	7	7	3	3	9	3	3	6	....	....	1	....	....	....	....	....
	3	4	2	3	7	1	3	2	5	4	1	2	3	1	1	....	....	....
146	6	4	6	7	2	3	8	8	3	5	....	....	....	....	....	....	....	....
	1	3	1	3	7	....	2	2	5	3	1	1	2	1	....	....	....	....
147	1	....	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....
	2	1	1	....	....	1	1	....	....	1	....	....	1	....	1	....	....	....
148	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....
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149	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
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Table 23 — New York State (exclusive of New York City): *Deaths by causes,*

Internat. List No.	CAUSE OF DEATH		All ages	Under 1 year	1	2	3	4	Under 5 years	5 to 9	10 to 14	15 to 19
			AGE									
	XI. Early infancy		3,620	3,619					3,619			
	Males		2,085	2,084					2,084			
	Females		1,535	1,535					1,535			
151	Congenital debility, icterus, and sclerema	M	1,598	1,598					1,598			
		F	1,172	1,172					1,172			
	Premature birth	M	1,273	1,273					1,273			
		F	948	948					948			
	Congenital debility, "atrophy," "marasmus," etc	M	325	325					325			
		F	224	224					224			
152	Other causes peculiar to early infancy	M	481	481					481			
		F	362	362					362			
	Injuries at birth	M	343	343					343			
		F	243	243					243			
	Other causes peculiar to early infancy	M	138	138					138			
		F	119	119					119			
153	Lack of care	M	6	5					5			
		F	1	1					1			
	XII. Old age		549									
	Males		220									
	Females		329									
154	Senility	M	220									
		F	329									
	XIII. External causes		4,374	87	82	75	78	53	375	226	184	241
	Males		3,100	48	51	42	32	20	193	169	150	193
	Females		1,274	39	31	33	46	33	182	57	34	48
	Suicides	M	393									5
		F	126								1	6
155	By poison	M	42									
		F	41									4
156	By asphyxia	M	18									
		F	18									
157	By hanging or strangulation	M	135									1
		F	28									1
158	By drowning	M	22									1
		F	16									
159	By firearms	M	125									2
		F	8								1	1
160	By cutting or piercing instruments	M	33									1
		F	7									
161	By jumping from high places	M	11									
		F	4									
162	By crushing	M	5									
		F	1									
163	Other suicides	M	2									
		F	3									
	Accidental or undefined	M	2,616	41	51	41	32	20	185	169	148	185
		F	1,116	34	31	32	46	33	176	57	33	41
164	Poisoning by food	M	26	2	2		1	1	6	5	1	2
		F	18	3				2	5		1	
165	Other acute poisonings	M	46	1	9	3	4	1	18		1	
		F	35	1	4	2	3	1	11	1		
166	Conflagration	M	28	1	3		4	1	9	4		
		F	19		3		3	2	8	2	3	
167	Burns (conflagration excepted)	M	147	6	14	22	11	2	55	6	4	4
		F	181	4	12	16	23	18	73	16	4	8
168	Absorption of deleterious gases (conflagration excepted)	M	94	24		1		1	26	3	2	
		F	38	12		1			13			1
169	Accidental drowning	M	342		6	4	3	5	18	55	42	64
		F	53	4	2		3		9	3	8	8
170	Traumatism by firearms	M	71							5	14	16
		F	4			1			1			2

classified by sex, and age at death (5-year age groups): 1920 — (Continued)

Internat. List No.	Age — (*Continued*)																
	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 years and over	Unknown
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
151	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
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152	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
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153	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	1	3	12	27	91	132	161	88	31	2	1
	....	....	....	....	....	....	....	....	1	4	13	42	55	55	39	11	....	....
	....	....	....	....	....	....	....	1	2	8	14	49	77	106	49	20	2	1
154	....	....	....	....	....	....	....	....	1	4	13	42	55	55	39	11	....	....
	....	....	....	....	....	....	....	1	2	8	14	49	77	106	49	20	2	1
	290	292	267	300	246	240	239	226	216	225	209	204	174	143	48	13	1	15
	242	237	218	255	206	201	193	174	149	153	129	100	65	42	14	6	1	10
	48	55	49	45	40	39	46	52	67	72	80	104	109	101	34	7	....	5
	20	27	38	33	53	36	45	34	22	33	24	11	6	6	....	....	....	....
	14	15	16	11	13	8	10	11	7	8	4	....	1	1	....	....	....	....
155	4	3	3	2	10	3	4	4	1	2	3	1	1	1	....	....	....	....
	8	4	6	3	4	4	1	1	1	3	2	....	....	....	....	....	....	....
156	1	1	3	1	2	....	3	3	2	1	1	....	....	....	....	....	....	....
	2	2	4	1	3	1	1	2	1	1	....	....	....	....	....	....	....	....
157	5	7	8	10	15	15	13	10	8	16	12	5	5	5	....	....	....	....
	2	3	2	2	1	2	4	4	3	1	1	....	1	1	....	....	....	....
158	1	1	2	3	....	1	5	4	2	1	....	1	....	....	....	....	....	....
	2	1	1	2	3	1	3	1	1	1	....	....	....	....	....	....	....	....
159	7	12	18	11	21	11	14	8	6	10	3	2	....	....	....	....	....	....
	....	3	1	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....
160	1	....	3	4	3	5	5	4	....	3	2	2	....	....	....	....	....	....
	....	2	1	2	....	....	....	1	1	....	....	....	....	....	....	....	....	....
161	1	3	1	1	2	....	....	1	1	....	1	....	....	....	....	....	....	....
	....	....	1	....	1	....	....	1	....	....	1	....	....	....	....	....	....	....
162	....	....	....	1	....	....	1	....	1	....	2	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
163	....	....	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....
	....	....	....	1	1	....	....	....	1	1	....	....	....	....	....	....	....	....
	213	198	169	210	145	156	144	138	123	120	103	89	59	36	14	6	1	5
	31	32	32	29	26	28	35	40	60	64	76	104	108	100	34	7	....	3
164	....	2	....	1	1	....	1	1	1	1	3	1	....	....	....	....	....	....
	....	3	2	1	....	1	....	1	....	....	3	....	1	....	....	....	....	....
165	1	2	7	3	2	4	1	1	1	....	1	2	2	....	....	....	....	....
	4	5	3	5	1	....	....	2	1	1	1	....	....	....	....	....	....	....
166	....	1	....	1	1	....	1	....	2	1	1	1	1	....	....	....	....	....
	....	....	1	1	1	1	1	....	....	....	1	....	....	....	....	....	....	....
167	8	11	8	13	14	3	4	8	5	2	1	4	2	....	....	....	....	....
	5	5	5	6	5	1	5	2	10	5	8	13	6	4	....	....	....	....
168	2	2	5	10	4	5	11	4	4	7	1	2	3	3	....	....	....	....
	1	....	1	2	2	....	3	....	5	1	3	1	3	2	....	....	....	....
169	36	30	12	21	14	14	9	8	9	7	1	2	....	....	....	....	....	....
	7	2	2	1	1	2	3	1	....	1	....	2	....	....	....	....	....	3
170	8	9	3	3	4	3	....	3	1	1	1	....	....	....	....	....	....	....
	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Table 23 — NEW YORK STATE (exclusive of New York City): *Deaths by causes,*

Internat. List No.	CAUSE OF DEATH		AGE: All ages	Under 1 year	1	2	3	4	Under 5 years	5 to 9	10 to 14	15 to 19
	XIII. External causes — (*Concluded*)											
171	Traumatism by cutting or piercing instruments	M	10	....	....	....	....	....	....	....	....	....
		F	4	1	....	....	....	....	1	....	....	....
172	Traumatism by fall	M	386	....	7	6	2	1	16	2	5	10
		F	449	2	3	1	3	1	10	3	2	....
173	Traumatism in mines and quarries	M	12	....	....	....	....	....	....	....	....	1
		F	....	....	....	....	....	....	....	....	....	....
	Traumatism in mines	M	10	....	....	....	....	....	....	....	....	1
		F	....	....	....	....	....	....	....	....	....	....
	Traumatism in quarries	M	2	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
174	Traumatism by machines	M	86	....	....	....	....	....	....	1	....	6
		F	3	....	....	....	....	....	....	....	1	2
175	Traumatism by other crushing	M	1,103	....	5	5	6	8	24	79	66	65
		F	268	2	3	7	11	9	32	29	14	18
	Railroad accidents and injuries	M	397	....	2	....	....	1	3	7	12	22
		F	37	....	....	....	1	1	2	4	....	2
	Street car accidents and injuries	M	49	....	....	....	....	....	....	2	2	2
		F	23	....	....	....	2	....	2	2	....	....
	Automobile accidents and injuries	M	488	....	3	5	6	5	19	58	43	28
		F	188	1	3	6	7	8	25	20	12	15
	Injuries by other vehicles	M	88	....	....	....	....	2	2	10	9	10
		F	16	....	....	1	1	....	2	3	2	1
	Landslide, other crushing	M	81	....	....	....	....	....	....	2	....	3
		F	4	1	....	....	....	....	1	....	....	....
176	Injuries by animals	M	38	....	....	....	....	....	....	2	3	....
		F	4	1	....	1	....	....	2	....	....	....
177	Starvation	M	3	....	....	....	....	....	....	....	....	....
		F	3	1	....	....	....	....	1	....	....	....
178	Excessive cold	M	12	....	....	....	....	....	....	....	1	....
		F	6	....	....	....	....	....	....	....	....	....
179	Effects of heat	M	4	1	....	....	....	....	1	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
180	Lightning	M	9	....	....	....	....	....	....	....	2	....
		F	3	....	1	....	....	....	1	....	....	....
181	Electricity (lightning excepted)	M	45	....	....	....	....	....	....	....	3	5
		F	1	....	....	....	....	....	....	....	....	....
185	Fractures (cause not specified)	M	16	....	....	....	....	....	....	1	....	1
		F	3	....	....	....	....	....	....	....	....	....
186	Other external violence	M	143	6	5	....	1	....	12	6	4	11
		F	24	3	3	3	....	....	9	8	....	2
	Homicide	M	91	7	....	1	....	....	8	....	2	3
		F	32	5	....	1	....	....	6	....	....	1
182	By firearms	M	54	....	....	1	....	....	1	....	1	2
		F	15	....	....	....	....	....	....	....	....	....
183	By cutting or piercing instruments	M	11	1	....	....	....	....	1	....	....	1
		F	3	1	....	....	....	....	1	....	....	....
184	By other means	M	26	6	....	....	....	....	6	....	1	....
		F	14	4	....	1	....	....	5	....	....	1
	XIV. Ill-defined diseases		75	16	10	2	....	1	29	1	....	....
	Males		45	6	6	....	....	....	12	1	....	....
	Females		30	10	4	2	....	1	17	....	....	....
187	Ill-defined organic diseases	M	4	....	....	....	....	....	....	....	....	....
		F	1	....	....	....	....	....	....	....	....	....
188	Sudden death	M	....	....	....	....	....	....	....	....	....	....
		F	1	....	....	....	....	....	....	....	....	....
189	Not specified or ill-defined	M	41	6	6	....	....	....	12	1	....	....
		F	28	10	4	2	....	1	17	....	....	....
	Ill-defined	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....
	Not specified or unknown	M	....	....	....	....	....	....	....	....	....	....
		F	....	....	....	....	....	....	....	....	....	....

classified by sex, and age at death (5-year age groups): **1920 — (Continued)**

Internat. List No.	AGES — (Continued) 20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 year and over	Unknown
171	....	2	1	1	....	2	2	....	....	1	1	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	1	1	1	....	....	....	....	....	....
172	14	14	14	18	16	21	19	24	22	32	37	43	35	24	13	6	1	....
	3	2	....	2	3	2	5	17	24	36	48	76	90	92	33	7	....	....
173	2	4	1	2	1	....	....	1	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	2	4	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
174	8	7	10	9	7	5	10	9	2	3	5	4	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
175	105	95	88	102	69	86	71	61	55	54	37	26	12	5	1	....	....	2
	12	13	17	10	12	21	16	14	17	16	13	6	6	1	1	....	....	....
	54	36	42	47	28	31	28	25	20	19	9	6	4	2	1	....	....	1
	1	2	3	....	....	3	2	3	7	3	1	....	2	....	1	....	....	....
	4	2	2	5	4	4	2	5	5	5	2	1	1	....	....	....	....	1
	....	1	2	2	2	1	1	2	1	1	2	1	2	1	....	....	....	....
	35	42	31	33	30	35	29	24	21	19	19	15	4	3	....	....	....	....
	10	9	12	7	8	16	10	8	8	12	10	4	2	....	....	....	....	....
	7	5	9	6	2	4	4	3	3	9	3	2	....	....	....	....	....	....
	1	....	....	1	1	....	2	1	1	....	....	1	....	....	....	....	....	....
	5	10	4	11	5	12	8	4	6	2	4	2	3	....	....	....	....	....
	....	1	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
176	1	1	....	3	....	3	2	6	7	3	4	2	....	1	....	....	....	....
	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
177	....	....	1	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....
	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....
178	....	....	1	....	1	2	1	2	1	....	1	....	....	1	....	....	....	1
	....	....	....	....	....	....	....	1	1	2	1	1	....	....	....	....	....	....
179	....	....	....	....	....	....	....	2	....	....	....	....	1	....	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
180	....	1	....	2	....	....	....	1	....	1	1	....	1	....	....	....	....	....
	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....
181	9	4	6	9	2	2	....	2	1	1	1	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
185	3	1	4	1	2	2	1	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	....	....	1	....	....	....	1	....	1	....	....	....	....
186	16	12	8	10	7	4	11	10	12	6	6	2	2	2	....	....	....	2
	....	1	....	....	....	....	1	1	1	....	1	3	2	....	....	....	....	....
	9	12	11	12	8	9	4	2	4	....	2	....	....	....	....	....	....	5
	3	8	1	5	1	3	1	1	....	....	....	....	....	....	....	....	....	2
182	5	7	8	8	7	6	3	2	2	....	1	....	....	....	....	....	....	1
	2	8	1	5	1	1	1	1	....	....	....	....	....	....	....	....	....	....
183	2	2	2	2	....	1	....	....	....	....	....	....	....	....	....	....	....	....
	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
184	2	3	1	2	1	2	1	....	2	....	1	....	....	....	....	....	....	4
	1	8	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	2
	....	1	1	3	1	2	1	4	2	7	3	4	4	5	1	....	....	6
	....	1	....	3	1	1	1	4	2	4	1	2	8	2	1	....	....	6
	....	....	1	....	....	1	....	....	....	3	2	2	1	3	....	....	....	....
187	....	....	....	....	....	....	....	1	....	....	....	1	1	1	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....
188	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
189	....	1	....	3	1	1	1	3	2	4	1	1	2	1	1	....	....	6
	....	....	1	....	....	....	....	....	....	3	2	1	1	3	....	....	....	....
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
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	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Table 24 — NEW YORK STATE (exclusive of New York City) — *Births, exclusive of mothers, and country of birth of foreign-born*

Line number	DISTRICT	Total living births	Total children born to white mothers	WHITE — NATIVITY: United States	WHITE — NATIVITY: Total foreign-born mothers	WHITE — NATIVITY — COUNTRY: England, Scotland, Wales	WHITE — NATIVITY — COUNTRY: Ireland	WHITE — NATIVITY — COUNTRY: Germany (excluding German-Poland)
1	State of New York (exclusive of New York City)	102,604	101,765	70,608	31,154	1,534	1,489	1,201
2	Cities	59,997	59,498	37,440	22,057	1,017	987	774
3	Rural	42,607	42,267	33,168	9,097	517	502	427
4	ALBANY COUNTY	3,543	3,522	2,476	1,046	33	84	31
5	Albany	2,294	2,277	1,674	603	21	66	27
6	Cohoes	422	421	257	164	5	3	......
7	Watervliet	295	294	185	109	2	12	1
8	Rest of county	532	530	360	170	5	3	3
9	ALLEGANY COUNTY	647	647	618	29	3	4	......
10	BROOME COUNTY	2,867	2,860	2,055	805	28	27	10
11	Binghamton	1,677	1,670	1,126	544	20	20	6
12	Rest of county	1,190	1,190	929	261	8	7	4
13	CATTARAUGUS COUNTY	1,553	1,543	1,327	216	6	4	21
14	Olean	544	538	418	120	5	2	6
15	Salamanca	219	218	184	84	......	1	2
16	Rest of county	790	787	725	62	1	1	13
17	CAYUGA COUNTY	1,191	1,183	807	376	21	14	3
18	Auburn	764	757	421	336	12	12	2
19	Rest of county	427	426	386	40	9	2	1
20	CHAUTAUQUA COUNTY	2,444	2,440	1,735	705	32	4	29
21	Dunkirk	567	567	339	228	2	1	18
22	Jamestown	813	813	542	271	19	......	3
23	Rest of county	1,064	1,060	854	206	11	3	8
24	CHEMUNG COUNTY	1,462	1,447	1,241	206	7	7	6
25	Elmira	1,168	1,154	983	171	7	7	6
26	Rest of county	294	293	258	35	......	......	......
27	CHENANGO COUNTY	620	619	554	65	4	7	4
28	Norwich	179	178	131	47	2	6	1
29	Rest of county	441	441	423	18	2	1	3
30	CLINTON COUNTY	1,145	1,141	1,037	104	7	3	1
31	Plattsburg	289	289	266	23	4	1	......
32	Rest of county	856	852	771	81	3	2	1
33	COLUMBIA COUNTY	735	724	522	202	10	5	9
34	Hudson	316	310	198	112	4	......	1
35	Rest of county	419	414	324	90	6	5	8
36	CORTLAND COUNTY	616	616	543	73	7	6	4
37	Cortland	290	290	235	55	4	4	1
38	Rest of county	326	326	308	18	3	2	3
39	DELAWARE COUNTY	813	810	752	58	2	2	7
40	DUTCHESS COUNTY	1,693	1,648	1,184	464	25	22	19
41	Beacon	206	200	145	55	2	4	......
42	Poughkeepsie	813	793	523	270	14	7	9
43	Rest of county	674	655	516	139	9	11	10

stillbirths, in each city and in the rest of each county, classified by nativity of white mothers; also births to colored mothers: 1920

MOTHERS — OF WHITE MOTHERS — OF BIRTH OF FOREIGN-BORN MOTHERS: Italy	Russia (excluding Russian-Poland)	Austria (excluding Austrian-Poland)	Hungary	Poland (includes Russia, Austria, Germany and unspecified)	Canada (French)	Canada, other	Norway, Sweden, Denmark	Other foreign countries	Country not stated	COLORED MOTHERS: Total children born to colored mothers	COLOR OF MOTHER: Negro	American Indian	Chinese, Japanese and others	Line number
10,926	2,522	2,752	637	6,291	300	1,757	487	1,258	3	839	749	83	7	1
7,964	1,786	1,857	455	4,907	132	1,122	268	788	1	499	478	15	6	2
2,962	736	895	182	1,384	168	635	219	470	2	340	271	68	1	3
336	158	125	3	165	15	39	7	50	.....	21	20	1	.....	4
209	107	26	2	93	4	11	5	32	.....	17	17	.....	.....	5
18	31	21	.....	45	11	21	.....	9	.....	1	.....	1	.....	6
27	8	25	1	22	.....	4	.....	7	.....	1	1	.....	.....	7
82	12	53	.....	5	.....	3	2	2	.....	2	2	.....	.....	8
9	1	2	1	1	.....	3	1	4	.....	.....	.....	.....	.....	9
161	182	183	111	57	2	11	3	30	.....	7	7	.....	.....	10
95	108	131	105	31	1	8	2	17	.....	7	7	.....	.....	11
66	74	52	6	26	1	3	1	13	.....	.....	.....	.....	.....	12
42	4	40	.....	58	1	9	6	25	.....	10	6	4	.....	13
24	1	24	.....	34	1	4	3	16	.....	6	6	.....	.....	14
6	1	3	.....	13	.....	1	1	6	.....	1	.....	1	.....	15
12	2	13	.....	11	.....	4	2	3	.....	3	.....	3	.....	16
146	5	110	1	59	2	7	1	7	.....	8	8	.....	.....	17
137	4	103	.....	53	2	4	1	6	.....	7	7	.....	.....	18
9	1	7	1	6	.....	3	.....	1	.....	1	1	.....	.....	19
331	13	29	2	119	1	18	117	10	.....	4	3	1	.....	20
53	10	22	.....	108	.....	6	3	5	.....	.....	.....	.....	.....	21
137	2	3	.....	4	1	5	94	3	.....	.....	.....	.....	.....	22
141	1	4	2	7	.....	7	20	2	.....	4	3	1	.....	23
69	15	50	.....	30	1	7	3	11	.....	15	14	1	.....	24
69	14	25	.....	22	1	6	3	11	.....	14	14	.....	.....	25
.....	1	25	.....	8	.....	1	.....	.....	.....	1	.....	1	.....	26
33	6	.....	1	.....	.....	4	4	2	.....	1	1	.....	.....	27
32	3	.....	.....	.....	.....	2	1	.....	.....	1	1	.....	.....	28
1	3	.....	1	.....	.....	2	3	2	.....	.....	.....	.....	.....	29
4	11	1	.....	5	30	37	2	3	.....	4	4	.....	.....	30
2	3	.....	.....	2	2	6	2	1	.....	.....	.....	.....	.....	31
2	8	1	.....	3	28	31	.....	2	.....	4	4	.....	.....	32
46	24	55	12	33	2	2	3	1	.....	11	11	.....	.....	33
29	14	35	8	17	2	2	.....	.....	.....	6	6	.....	.....	34
17	10	20	4	16	.....	.....	3	1	.....	5	5	.....	.....	35
37	5	2	.....	2	.....	5	1	4	.....	.....	.....	.....	.....	36
36	4	2	.....	1	.....	1	.....	2	.....	.....	.....	.....	.....	37
1	1	.....	.....	1	.....	4	1	2	.....	.....	.....	.....	.....	38
30	6	3	.....	4	.....	2	2	.....	.....	3	3	.....	.....	39
181	38	37	39	67	1	7	9	19	.....	45	44	.....	1	40
24	12	2	4	4	.....	.....	.....	3	.....	6	6	.....	.....	41
89	20	24	25	61	.....	5	6	10	.....	20	19	.....	1	42
68	6	11	10	2	1	2	3	6	.....	19	19	.....	.....	43

Table 24 — NEW YORK STATE (exclusive of New York City) — *Births, exclusive of mothers, and country of birth of foreign-born mothers;*

Line number	DISTRICT	Total living births	Total children born to white mothers	WHITE				
				NATIVITY				
						COUNTRY		
				United States	Total foreign-born mothers	England, Scotland, Wales	Ireland	Germany (excluding German-Poland)
44	ERIE COUNTY	16,457	16,308	10,084	6,224	223	181	372
45	Buffalo	13,317	13,198	8,100	5,098	205	161	292
46	Lackawanna*	872	857	392	465	4	11	8
47	—*Our Lady of Victory Infant Home*	259	258	220	38	2	9	2
48	Tonawanda	222	222	169	53	3	.....	8
49	Rest of county	2,046	2,031	1,423	608	21	9	64
50	ESSEX COUNTY	745	744	635	109	4	6	2
51	FRANKLIN COUNTY	1,096	1,072	914	158	11	3	.....
52	FULTON COUNTY	846	844	595	249	14	9	11
53	Gloversville	443	441	291	150	9	5	8
54	Johnstown	184	184	108	76	5	3	2
55	Rest of county	219	219	196	23	.....	1	1
56	GENESEE COUNTY	778	760	557	20	11	6	8
57	Batavia	348	348	229	119	.	4	3
58	Rest of county	430	412	328	84	4	2	5
59	GREENE COUNTY	436	436	381	55	2	3	1
60	HAMILTON COUNTY	79	79	71	8	.....	1	.....
61	HERKIMER COUNTY	1,436	1,433	869	564	21	13	17
62	Little Falls	352	352	151	201	6	5	3
63	Rest of county	1,084	1,081	718	363	15	8	14
64	JEFFERSON COUNTY	1,722	1,722	1,369	353	28	5	3
65	Watertown	787	787	586	201	18	3	1
66	Rest of county	935	935	783	152	10	2	2
67	LEWIS COUNTY	489	489	430	59	1	2	1
68	LIVINGSTON COUNTY	686	682	498	184	10	19	2
69	MADISON COUNTY	828	826	706	119	12	5	3
70	Oneida	296	294	244	50	7	2	2
71	Rest of county	532	532	462	69	5	3	1
72	MONROE COUNTY	7,688	7,661	4,687	2,974	164	87	144
73	Rochester	6,732	6,709	3,929	2,780	148	82	128
74	Rest of county	956	952	758	194	16	5	16
75	MONTGOMERY COUNTY	1,271	1,268	699	569	12	14	22
76	Amsterdam	835	832	363	469	11	13	15
77	Rest of county	436	436	336	100	1	1	7
78	NASSAU COUNTY	2,788	2,730	1,675	1,055	69	96	56
79	Glen Cove	233	228	91	137	10	3	.....
80	Rest of county	2,555	2,502	1,584	918	59	93	56
81	NIAGARA COUNTY	2,928	2,914	1,566	1,348	80	40	21
82	Lockport	417	415	304	111	8	5	2
83	Niagara Falls	1,550	1,542	610	932	61	29	6
84	North Tonawanda	414	414	200	214	2	5	3
85	Rest of county	547	543	452	91	9	1	10

* Includes Our Lady of

tillbirths, in each city and in the rest of each county, classified by nativity of whit: also births to colored mothers: **1920 — (Continued)**

MOTHERS										COLORED MOTHERS				
OF WHITE MOTHERS										Total children born to colored mothers	COLOR OF MOTHER			Line number
OF BIRTH OF FOREIGN-BORN MOTHERS									Country not stated					
Italy	Russia (excluding Russian-Poland)	Austria (excluding Austrian-Poland)	Hungary	Poland (includes Russia, Austria, Germany and unspecified)	Canada (French)	Canada, other	Norway, Sweden, Denmark	Other foreign countries			Negro	American Indian	Chinese, Japanese and others	
1,360	392	538	198	2,371	25	382	42	130	.....	149	130	19	.....	44
1,191	336	372	139	1,911	25	327	36	108	.....	119	111	8	.....	45
50	26	59	24	258	.....	17	2	6	.....	15	15	.....	.....	46
1	4	2	.....	.....	.....	14	2	2	.....	1	1	.....	.....	47
2	1	15	13	1	.....	7	1	2	.....	.....	.....	.....	.....	48
117	29	92	22	201	.....	31	3	19	.....	15	4	11	.....	49
25	6	6	8	32	2	8	1	9	.....	1	1	.....	.....	50
8	3	1	1	.....	57	69	.....	5	.....	24	1	23	.....	51
108	39	35	4	5	2	7	2	13	.....	2	2	.....	.....	52
85	15	9	.....	3	1	5	2	8	.....	2	2	.....	.....	53
22	18	14	4	1	.....	2	.....	5	.....	.....	.....	.....	.....	54
1	6	12	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	55
117	11	6	1	29	.....	10	.....	4	.....	18	8	10	.....	56
73	7	3	1	16	.....	3	.....	2	.....	.....	.....	.....	.....	57
44	4	3	.....	13	.....	7	.....	2	.....	18	8	10	.....	58
25	11	6	3	1	.....	1	1	1	.....	.....	.....	.....	.....	59
.....	1	.....	.....	.....	1	1	3	1	.....	.....	.....	.....	.....	60
210	74	73	2	114	9	18	4	9	.....	3	2	1	.....	61
42	44	50	1	45	.....	3	1	1	.....	.....	.....	.....	.....	62
168	30	23	1	69	9	15	3	8	.....	3	2	1	.....	63
73	8	27	12	21	20	139	2	15	.....	.....	.....	.....	.....	64
53	5	11	9	7	12	77	1	4	.....	.....	.....	.....	.....	65
20	3	16	3	14	8	62	1	11	.....	.....	.....	.....	.....	66
.....	4	10	6	19	1	11	3	1	.....	.....	.....	.....	.....	67
140	1	2	.....	3	.....	5	.....	2	.....	4	4	.....	.....	68
79	4	3	2	1	.....	5	.....	5	1	2	1	.....	1	69
34	.....	2	.....	.....	.....	1	.....	2	.....	2	1	.....	1	70
45	4	1	2	1	.....	4	.....	3	1	.....	.....	.....	.....	71
1,610	246	103	17	219	18	203	12	151	.....	27	27	.....	.....	72
1,522	243	97	16	206	18	180	10	130	.....	23	23	.....	.....	73
88	3	6	1	13	.....	23	2	21	.....	4	4	.....	.....	74
170	21	37	.....	281	.....	3	.....	9	.....	3	2	.....	1	75
128	14	22	.....	256	.....	3	.....	7	.....	3	2	.....	1	76
42	7	15	.....	25	.....	.....	.....	2	.....	.....	.....	.....	.....	77
362	69	75	9	216	.....	15	50	38	.....	58	58	.....	.....	78
70	12	4	3	31	.....	.....	2	2	.....	5	5	.....	.....	79
292	57	71	6	185	.....	15	48	36	.....	58	53	.....	.....	80
360	95	148	27	301	8	208	4	56	.....	14	8	6	.....	81
51	4	8	1	5	1	23	.....	3	.....	2	2	.....	.....	82
280	69	38	6	242	5	147	2	47	.....	8	6	2	.....	83
24	16	96	17	41	.....	5	.....	5	.....	.....	.....	.....	.....	84
5	6	6	3	13	2	33	2	1	.....	4	.....	4	.....	85

V ictory Infant Home.

Table 24 — NEW YORK STATE (exclusive of New York City) — *Births, exclusive of mothers, and country of birth of foreign-born mothers;*

Line number	DISTRICT	Total living births	Total children born to white mothers	WHITE — NATIVITY: United States	WHITE — NATIVITY: Total foreign-born mothers	COUNTR…: England, Scotland, Wales	COUNTR…: Ireland	COUNTR…: Germany (excluding German-Poland)
86	ONEIDA COUNTY	4,325	4,315	2,331	1,984	100	39	27
87	Rome	691	689	373	316	16	2	1
88	Utica	2,442	2,436	1,130	1,306	53	32	16
89	Sherrill	22	22	17	5	1	......	1
90	Rest of county	1,170	1,168	811	357	30	5	9
91	ONONDAGA COUNTY	5,418	5,388	3,664	1,723	75	92	77
92	Syracuse	4,191	4,168	2,769	1,398	60	82	64
93	Rest of county	1,227	1,220	895	325	15	10	13
94	ONTARIO COUNTY	1,094	1,091	851	240	27	15	6
95	Canandaigua	216	216	186	30	4	1	......
96	Geneva	378	376	254	122	7	11	3
97	Rest of county	500	499	411	88	16	3	3
98	ORANGE COUNTY	2,365	2,338	1,797	541	36	53	17
99	Middletown	310	306	247	59	4	7	1
100	Newburgh	675	670	502	168	14	19	5
101	Port Jervis	249	249	212	37	3	1	1
102	Rest of county	1,131	1,113	836	277	15	26	10
103	ORLEANS COUNTY	547	546	419	127	20	......	7
104	OSWEGO COUNTY	1,547	1,546	1,247	299	22	6	9
105	Fulton	316	316	219	97	3	......	2
106	Oswego	565	564	409	155	11	5	5
107	Rest of county	666	666	619	47	8	1	2
108	OTSEGO COUNTY	818	817	737	80	8	10	7
109	Oneonta	254	253	224	29	4	2	......
110	Rest of county	564	564	513	51	4	8	7
111	PUTNAM COUNTY	230	229	171	58	6	10	1
112	RENSSELAER COUNTY	1,947	1,941	1,530	411	21	50	17
113	Rensselaer	101	101	88	13	3	2	......
114	Troy	1,385	1,379	1,057	322	15	43	11
115	Rest of county	461	461	385	76	3	5	6
116	ROCKLAND COUNTY	884	860	645	215	10	8	15
117	ST. LAWRENCE COUNTY	1,967	1,961	1,641	319	13	9	2
118	Ogdensburg	327	327	268	59	......	4	1
119	Rest of county	1,640	1,634	1,373	260	13	5	1
120	SARATOGA COUNTY	1,193	1,189	872	317	17	15	5
121	Saratoga Springs	273	271	232	39	5	6	......
122	Mechanicville	194	193	105	88	2	2	......
123	Rest of county	726	725	535	190	10	7	5
124	SCHENECTADY COUNTY	2,332	2,323	1,381	942	51	26	32
125	Schenectady	1,968	1,959	1,129	830	36	21	26
126	Rest of county	364	364	252	112	15	5	6
127	SCHOHARIE COUNTY	377	376	352	24	2	1	4
128	SCHUYLER COUNTY	256	256	223	33	1	1	......

stillbirths, in each city and in the rest of each county, classified by nativity of white also births to colored mothers: **1920 — (Continued)**

MOTHERS										COLORED MOTHERS				
OF WHITE MOTHERS											COLOR OF MOTHER			
OF BIRTH OF FOREIGN-BORN MOTHERS														
Italy	Russia (excluding Russian-Poland)	Austria (excluding Austrian-Poland)	Hungary	Poland (includes Russia, Austria, Germany and unspecified)	Canada (French)	Canada, other	Norway, Sweden, Denmark	Other foreign countries	Country not stated	Total children born to colored mothers	Negro	American Indian	Chinese, Japanese and others	Line number
860	65	61	2	644	8	48	4	126	.....	10	10	.....	.....	86
199	13	30	1	42	.....	4	.....	8	.....	2	2	.....	.....	87
625	43	7	1	423	4	18	2	82	.....	6	6	.....	.....	88
.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	89
36	9	24	.....	179	4	23	2	36	.....	2	2	.....	.....	90
586	202	173	8	323	13	97	10	67	1	30	20	10	.....	91
475	187	123	.....	266	9	75	7	50	1	23	20	3	.....	92
111	15	50	8	57	4	22	3	17	.....	7	.....	7	.....	93
126	3	9	1	2	.....	13	8	30	.....	3	3	.....	.....	94
20	2	.....	.....	.....	.....	2	.....	1	.....	.....	.....	.....	.....	95
80	.....	1	1	1	.....	4	4	10	.....	2	2	.....	.....	96
23	1	8	.....	1	.....	7	4	19	.....	1	1	.....	.....	97
184	57	60	13	74	.....	4	14	29	.....	27	27	.....	.....	98
23	4	4	.....	3	.....	1	3	7	.....	4	4	.....	.....	99
75	21	14	3	7	.....	2	2	6	.....	5	5	.....	.....	100
13	2	7	.....	7	.....	.....	1	2	.....	.....	.....	.....	.....	101
71	30	35	10	57	.....	1	8	14	.....	18	18	.....	.....	102
66	.....	3	.....	17	.....	9	1	4	.....	1	1	.....	.....	103
117	18	18	.....	65	4	30	2	8	.....	1	1	.....	.....	104
41	5	9	.....	24	1	9	.....	3	.....	.....	.....	.....	.....	105
67	11	6	.....	33	3	10	.....	4	.....	1	1	.....	.....	106
9	2	3	.....	8	.....	11	2	1	.....	.....	.....	.....	.....	107
12	8	10	1	6	.....	4	4	10	.....	1	1	.....	.....	108
7	2	.....	1	3	.....	1	2	7	.....	1	1	.....	.....	109
5	6	10	.....	3	.....	3	2	3	.....	.....	.....	.....	.....	110
27	1	3	2	.....	.....	1	3	4	.....	1	1	.....	.....	111
117	37	57	2	52	4	11	9	34	.....	6	6	.....	.....	112
4	.....	1	1	1	.....	.....	.....	1	.....	.....	.....	.....	.....	113
94	19	47	.....	46	4	8	6	29	.....	6	6	.....	.....	114
19	18	9	1	5	.....	3	3	4	.....	.....	.....	.....	.....	115
72	28	47	6	11	.....	3	6	9	.....	24	24	.....	.....	116
25	8	8	16	18	39	165	1	15	1	6	1	5	.....	117
.....	.....	.....	1	1	13	37	.....	2	.....	.....	.....	.....	.....	118
25	8	8	15	17	26	128	1	13	1	1	1	5	.....	119
162	21	35	3	22	11	13	4	8	.....	4	4	.....	.....	120
20	4	.....	.....	1	1	.....	.....	2	.....	2	2	.....	.....	121
76	1	2	.....	.....	1	1	.....	3	.....	1	1	.....	.....	122
66	16	34	3	21	9	12	4	3	.....	1	1	.....	.....	123
400	65	42	8	284	4	27	9	14	.....	9	8	.....	1	124
353	58	32	8	249	3	25	7	12	.....	9	8	.....	1	125
47	7	10	.....	15	1	2	2	2	.....	.....	.....	.....	.....	126
3	2	2	2	5	.....	1	1	1	.....	1	1	.....	.....	127
27	.....	2	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	128

Table 24 — NEW YORK STATE (exclusive of New York City) — *Births, exclusive of mothers, and country of birth of foriegn-born mothers;*

Line number	DISTRICT	Total living births	Total children born to white mothers	WHITE — NATIVITY: United States	Total foreign-born mothers	COUNTRY: England, Scotland, Wales	Ireland	Germany (excluding German-Poland)
129	SENECA COUNTY	415	415	323	92	4	2	3
130	STEUBEN COUNTY	1,683	1,678	1,542	136	3	5	10
131	Corning	427	426	356	70	1	1	2
132	Hornell	295	295	244	51	2	4	6
133	Rest of county	961	957	942	15	......	......	2
134	SUFFOLK COUNTY	2,142	2,090	1,375	715	36	87	35
135	SULLIVAN COUNTY	539	539	382	157	4	4	7
136	TIOGA COUNTY	416	414	368	46	1	1	2
137	TOMPKINS COUNTY	684	679	579	100	3	10	2
138	Ithaca	350	345	283	62	......	8	1
139	Rest of county	334	334	296	38	3	2	1
140	ULSTER COUNTY	1,282	1,273	1,012	261	12	9	15
141	Kingston	496	491	425	66	4	4	5
142	Rest of county	786	782	587	195	8	5	10
143	WARREN COUNTY	680	680	595	85	4	19	2
144	Glens Falls	401	401	332	69	4	15	......
145	Rest of county	279	279	263	16	......	4	2
146	WASHINGTON COUNTY	810	810	689	121	8	16	1
147	WAYNE COUNTY	864	864	668	196	8	2	6
148	WESTCHESTER COUNTY	7,379	7,175	3,924	3,251	177	313	76
149	Peekskill, village	335	327	245	82	2	4	1
150	White Plains	477	462	291	171	10	27	6
151	Mt. Vernon	956	933	530	403	14	19	13
152	New Rochelle	673	618	354	264	18	38	12
153	Ossining, village	228	220	143	77	3	8	2
154	Port Chester, village	545	540	238	302	18	25	8
155	Yonkers	2,399	2,353	1,184	1,169	73	117	17
156	Rest of county	1,766	1,722	939	783	39	75	17
157	WYOMING COUNTY	554	551	471	80	4	7	6
158	YATES COUNTY	254	253	232	21	4	......	3

stillbirths, in each city and in the rest of each county, classified by nativity of whit also births to colored mothers: 1920 — (Concluded)

MOTHERS										COLORED MOTHERS				
OF WHITE MOTHERS										Total children born to colored mothers	COLOR OF MOTHER			
OF BIRTH OF FOREIGN-BORN MOTHERS														
Italy	Russia (excluding Russian-Poland)	Austria (excluding Austrian-Poland)	Hungary	Poland (includes Russia, Austria, Germany and unspecified)	Canada (French)	Canada, other	Norway, Sweden, Denmark	Other foreign countries	Country not stated		Negro	American Indian	Chinese, Japanese and others	Line number
68	.....	2	.....	2	.....	3	5	3	.....	.....	.....	.....	.....	129
66	2	14	.....	8	1	4	10	13	.....	5	5	.....	.....	130
34	2	11	.....	4	.....	2	7	6	.....	1	1	.....	.....	131
28	.....	3	.....	.....	.....	.....	2	6	.....	.....	.....	.....	.....	132
4	.....	.....	.....	4	1	2	1	1	.....	4	4	.....	.....	133
141	68	62	6	210	4	7	27	32	.....	52	50	2	.....	134
3	100	23	7	3	.....	2	1	3	.....	.....	.....	.....	.....	135
7	8	9	2	8	.....	2	2	4	.....	2	2	.....	.....	136
22	16	9	16	2	1	8	1	15	.....	5	5	.....	.....	137
19	3	4	13	2	1	2	.....	9	.....	5	5	.....	.....	138
3	13	5	3	.....	.....	1	1	6	.....	.....	.....	.....	.....	139
126	45	11	10	16	2	2	5	8	.....	9	9	.....	.....	140
17	19	2	1	9	1	1	.....	3	.....	5	5	.....	.....	141
109	26	9	9	7	1	1	5	5	.....	4	4	.....	.....	142
27	10	.....	.....	1	4	4	4	10	.....	.....	.....	.....	.....	143
27	9	.....	.....	.....	2	2	2	8	.....	.....	.....	.....	.....	144
.....	1	.....	.....	1	2	2	2	2	.....	.....	.....	.....	.....	145
44	3	20	.....	16	2	13	2	2	.....	.....	.....	.....	.....	146
77	3	2	1	1	.....	5	.....	91	.....	.....	.....	.....	.....	147
1,466	298	359	70	290	3	37	63	99	.....	204	201	.....	3	148
34	7	17	7	6	.....	.....	.....	4	.....	8	8	.....	.....	149
91	11	5	4	1	1	4	5	6	.....	15	15	.....	.....	150
274	43	9	5	5	1	6	6	8	.....	23	23	.....	.....	151
142	24	5	1	2	.....	2	12	8	.....	55	55	.....	.....	152
43	8	.....	1	2	.....	1	2	7	.....	8	8	.....	.....	153
158	24	25	.....	26	.....	4	4	10	.....	5	5	.....	.....	154
309	112	247	27	210	.....	12	16	29	.....	46	44	.....	2	155
415	69	51	25	38	1	8	18	27	.....	44	43	.....	1	156
18	1	3	.....	23	2	12	.....	4	.....	3	3	.....	.....	157
5	.....	.....	.....	.....	.....	1	8	.....	.....	1	1	.....	.....	158

Table 25 — New York State, New York City, and Rest of State: ***Number of legitimacy, plural births, attendant at***

	DISTRICT	Total living births	Sex		Legitimacy	
			Males	Females	Legitimate	Illegitimate
1	State of New York	235,460	121,414	114,046	233,034	2,426
2	New York City	132,856	68,562	64,294	131,429	1,427
3	Rest of State	102,604	52,852	49,752	101,605	999
4	Cities (exc. New York City)	59,993	30,747	29,250	59,328	669
5	Rural	42,607	22,105	20,502	42,277	330
6	Albany County	3,543	1,822	1,721	3,500	43
7	Albany	2,294	1,166	1,128	2,254	40
8	Cohoes	422	214	208	421	1
9	Watervliet	295	161	134	294	1
10	Rest of county	532	281	251	531	1
11	Allegany County	647	343	304	647	....
12	Broome County	2,867	1,483	1,384	2,818	49
13	Binghamton	1,677	864	813	1,632	45
14	Rest of county	1,190	619	571	1,186	4
15	Cattaraugus County	1,553	817	736	1,542	11
16	Olean	544	283	261	538	6
17	Salamanca	219	109	110	219	....
18	Rest of county	790	425	365	785	5
19	Cayuga County	1,191	621	570	1,184	7
20	Auburn	764	398	366	760	4
21	Rest of county	427	223	204	424	3
22	Chautauqua County	2,444	1,263	1,181	2,438	6
23	Dunkirk	567	279	288	567	....
24	Jamestown	813	419	394	811	2
25	Rest of county	1,064	565	499	1,060	4
26	Chemung County	1,462	751	711	1,444	18
27	Elmira	1,168	609	559	1,154	14
28	Rest of county	294	142	152	290	4
29	Chenango County	620	339	281	616	4
30	Norwich	179	96	83	178	1
31	Rest of county	441	243	198	438	3
32	Clinton County	1,145	621	524	1,136	9
33	Plattsburg	289	152	137	288	1
34	Rest of county	856	469	387	848	8
35	Columbia County	735	368	367	722	13
36	Hudson	316	157	159	311	5
37	Rest of county	419	211	208	411	8
38	Cortland County	616	321	295	614	2
39	Cortland	290	145	145	289	1
40	Rest of county	326	176	150	325	1
41	Delaware County	813	431	382	805	8
42	Dutchess County	1,693	892	801	1,672	21
43	Beacon	206	104	102	206	....
44	Poughkeepsie	813	422	391	803	10
45	Rest of county	674	366	308	663	11
46	Erie County	16,457	8,411	8,046	16,222	235
47	Buffalo	13,317	6,796	6,521	13,109	208
48	Lackawanna*	872	435	437	856	16
49	—Our Lady of Victory Infant Home	259	147	112	244	15
50	Tonawanda	222	124	98	222	....
51	Rest of county	2,046	1,056	990	2,035	11
52	Essex County	745	369	376	738	7

* Includes Our Lady o

births in each city and the rest of each county in the State, during 1920, *classified by sex, birth; also month of occurrence*

DISTRICT	Single and Plural			Attendant at Birth			
	Single births	Twins	Triplets or more	Physicians	Midwives	Others	None or not stated
1 State of New York	232,300	3,128	32	185,505	49,181	704	70
2 New York City	131,884	954	18	96,472	36,369	15	......
3 Rest of State	100,416	2,174	14	89,033	12,812	689	70
4 Cities (exc. New York City)	58,715	1,274	8	48,091	10,717	254	35
5 Rural	41,701	900	6	40,042	2,095	435	35
6 ALBANY COUNTY	3,468	75	......	3,026	507	9	1
7 Albany	2,253	41	......	1,991	302	......	1
8 Cohoes	412	10	......	352	70	......	......
9 Watervliet	289	6	......	251	44	......	......
10 Rest of county	514	18	......	432	91	9	......
11 ALLEGANY COUNTY	639	8	......	638	6	3	......
12 BROOME COUNTY	2,811	56	......	2,469	387	9	2
13 Binghamton	1,650	27	......	1,378	294	5	......
14 Rest of county	1,161	29	......	1,091	93	4	2
15 CATTARAUGUS COUNTY	1,514	39	......	1,485	41	26	1
16 Olean	528	16	......	502	31	11	......
17 Salamanca	213	6	......	214	3	2	......
18 Rest of county	773	17	......	769	7	13	1
19 CAYUGA COUNTY	1,175	16	......	1,064	118	9	......
20 Auburn	752	12	......	637	118	9	......
21 Rest of county	423	4	......	427	......	......	......
22 CHAUTAUQUA COUNTY	2,385	59	......	2,166	257	21	......
23 Dunkirk	545	22	......	399	168	......	......
24 Jamestown	803	10	......	739	65	9	......
25 Rest of county	1,037	27	......	1,028	24	12	......
26 CHEMUNG COUNTY	1,421	41	......	1,391	67	4	......
27 Elmira	1,139	29	......	1,117	49	2	......
28 Rest of county	282	12	......	274	18	2	......
29 CHENANGO COUNTY	610	7	3	609	2	8	1
30 Norwich	177	2	......	179	......	......	......
31 Rest of county	433	5	3	430	2	8	1
32 CLINTON COUNTY	1,107	38	......	1,129	9	7	......
33 Plattsburg	277	12	......	288	......	1	......
34 Rest of county	830	26	......	841	9	6	......
35 COLUMBIA COUNTY	721	14	......	627	100	8	......
36 Hudson	306	10	......	237	79	......	......
37 Rest of county	415	4	......	390	21	8	......
38 CORTLAND COUNTY	611	5	......	577	37	2	......
39 Cortland	288	2	......	255	35	......	......
40 Rest of county	323	3	......	322	2	2	......
41 DELAWARE COUNTY	803	10	......	790	3	20	......
42 DUTCHESS COUNTY	1,656	37	......	1,379	298	14	2
43 Beacon	204	2	......	167	38	1	......
44 Poughkeepsie	791	22	......	597	211	4	1
45 Rest of county	661	13	......	615	49	9	1
46 ERIE COUNTY	16,100	354	3	11,966	4,453	31	7
47 Buffalo	13,034	280	3	9,485	3,810	16	6
48 Lackawanna*	858	14	......	552	317	3	......
49 —Our Lady of Victory Infant Home	253	6	......	259	......	......	......
50 Tonawanda	211	11	......	209	13	......	......
51 Rest of county	1,997	49	......	1,720	313	12	1
52 ESSEX COUNTY	723	22	......	730	6	9	......

Victory Infant Home.

Table 25 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Number of legitimacy, plural births, attendant at*

	DISTRICT	Births Occurring in —					
		Jan.	Feb.	Mar.	April	May	June
1	**State of New York**	20,070	20,011	21,195	19,712	19,261	20,374
2	**New York City**	11,280	11,255	12,147	11,206	10,364	11,810
3	**Rest of State**	8,790	8,756	9,048	8,506	8,897	8,564
4	**Cities (exc. New York City)**	5,191	5,174	5,394	4,859	5,150	4,970
5	**Rural**	3,599	3,582	3,654	3,647	3,747	3,594
6	ALBANY COUNTY	306	312	314	301	300	283
7	Albany	202	193	207	203	192	191
8	Cohoes	42	46	32	25	33	27
9	Watervliet	17	26	24	26	27	22
10	Rest of county	45	47	51	47	48	43
11	ALLEGANY COUNTY	65	45	56	51	45	70
12	BROOME COUNTY	244	233	288	228	251	220
13	Binghamton	142	147	176	126	143	121
14	Rest of county	102	86	112	102	108	99
15	CATTARAUGUS COUNTY	127	151	143	139	135	113
16	Olean	43	51	53	42	39	39
17	Salamanca	14	24	18	20	21	23
18	Rest of county	70	76	72	77	75	51
19	CAYUGA COUNTY	92	95	97	106	92	92
20	Auburn	58	61	62	65	61	57
21	Rest of county	34	34	35	41	31	35
22	CHAUTAUQUA COUNTY	207	208	200	204	215	232
23	Dunkirk	50	51	42	45	52	60
24	Jamestown	59	73	61	70	95	75
25	Rest of county	98	84	97	89	68	97
26	CHEMUNG COUNTY	127	124	132	116	129	133
27	Elmira	94	102	107	101	105	104
28	Rest of county	33	22	25	15	24	29
29	CHENANGO COUNTY	46	45	54	54	62	64
30	Norwich	10	17	17	14	18	22
31	Rest of county	36	28	37	40	44	42
32	CLINTON COUNTY	93	92	107	118	108	96
33	Plattsburg	24	16	22	32	30	24
34	Rest of county	69	76	85	86	78	72
35	COLUMBIA COUNTY	71	54	60	58	62	69
36	Hudson	31	22	25	29	28	31
37	Rest of county	40	32	35	29	34	38
38	CORTLAND COUNTY	55	52	47	54	74	50
39	Cortland	19	26	22	27	32	24
40	Rest of county	36	26	25	27	42	26
41	DELAWARE COUNTY	69	58	83	64	79	77
42	DUTCHESS COUNTY	161	142	159	132	151	146
43	Beacon	19	22	19	14	13	14
44	Poughkeepsie	74	64	77	66	81	78
45	Rest of county	68	56	63	52	57	54
46	ERIE COUNTY	1,473	1,484	1,418	1,295	1,434	1,364
47	Buffalo	1,205	1,203	1,158	1,057	1,145	1,083
48	Lackawanna*	68	71	78	62	81	92
49	—Our Lady of Victory Infant Home	15	24	17	18	27	32
50	Tonawanda	26	33	20	20	15	16
51	Rest of county	174	177	162	156	193	173
52	ESSEX COUNTY	62	69	55	71	79	66

* Includes Our Lady of

births in each city and the rest of each county in the State, during 1920, *classified by sex, birth; also month of occurrence* — (Continued)

DISTRICT	Births Occurring in —					
	July	Aug.	Sept.	Oct.	Nov.	Dec.
1 **State of New York**	20,645	20,263	19,530	18,391	17,272	18,736
2 **New York City**	11,616	11,150	10,869	10,350	9,932	10,877
3 **Rest of State**	9,029	9,113	8,661	8,041	7,340	7,859
4 **Cities** (exc. New York City)	5,162	5,266	5,079	4,677	4,403	4,672
5 **Rural**	3,867	3,847	3,582	3,364	2,937	3,187
6 Albany County	298	317	303	297	231	281
7 Albany	197	194	194	179	154	188
8 Cohoes	34	39	32	42	30	40
9 Watervliet	21	36	20	34	21	21
10 Rest of county	46	48	57	42	26	32
11 Allegany County	62	53	58	46	47	49
12 Broome County	237	254	229	215	215	253
13 Binghamton	126	146	142	128	127	153
14 Rest of county	111	108	87	87	88	100
15 Cattaraugus County	125	142	118	114	124	122
16 Olean	54	50	49	42	41	41
17 Salamanca	6	16	14	16	22	25
18 Rest of county	65	76	55	56	61	56
19 Cayuga County	116	95	117	104	92	93
20 Auburn	66	57	83	68	62	64
21 Rest of county	50	38	34	36	30	29
22 Chautauqua County	212	234	201	204	158	169
23 Dunkirk	43	47	43	39	42	53
24 Jamestown	66	72	75	81	35	51
25 Rest of county	103	115	83	84	81	65
26 Chemung County	138	148	116	105	92	102
27 Elmira	115	109	96	78	74	83
28 Rest of county	23	39	20	27	18	19
29 Chenango County	49	68	41	49	40	48
30 Norwich	12	15	18	9	14	13
31 Rest of county	37	53	23	40	26	35
32 Clinton County	105	99	89	93	71	74
33 Plattsburg	32	26	27	21	15	20
34 Rest of county	73	73	62	72	56	54
35 Columbia County	58	66	57	56	64	60
36 Hudson	21	31	20	21	28	29
37 Rest of county	37	35	37	35	36	31
38 Cortland County	58	46	44	44	40	52
39 Cortland	30	27	19	19	17	28
40 Rest of county	28	19	25	25	23	24
41 Delaware County	72	74	57	61	60	59
42 Dutchess County	145	166	142	126	104	119
43 Beacon	20	22	19	24	12	8
44 Poughkeepsie	61	71	62	62	47	70
45 Rest of county	64	73	61	40	45	41
46 Erie County	1,411	1,425	1,433	1,273	1,167	1,230
47 Buffalo	1,153	1,142	1,161	1,021	949	1,040
48 Lackawanna*	61	81	72	72	62	72
49 —Our Lady of Victory Infant Home	27	30	20	22	14	13
50 Tonawanda	18	17	15	16	15	11
51 Rest of county	179	185	185	164	141	157
52 Essex County	63	72	66	50	46	46

Victory Infant Home.

Table 25 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Number of legitimacy, plural births, attendant a*

DISTRICT	Total living births	SEX		LEGITIMACY	
		Males	Females	Legitimate	Illegitimate
53 FRANKLIN COUNTY	1,096	561	535	1,081	15
54 FULTON COUNTY	846	432	414	840	6
55 Gloversville	443	234	209	442	1
56 Johnstown	184	93	91	181	3
57 Rest of county	219	105	114	217	2
58 GENESEE COUNTY	778	396	382	775	3
59 Batavia	348	180	168	346	2
60 Rest of county	430	216	214	429	1
61 GREENE COUNTY	436	234	202	435	1
62 HAMILTON COUNTY	79	37	42	79	....
63 HERKIMER COUNTY	1,436	690	746	1,429	7
64 Little Falls	352	159	193	351	1
65 Rest of county	1,084	531	553	1,078	6
66 JEFFERSON COUNTY	1,722	894	828	1,701	21
67 Watertown	787	411	376	779	8
68 Rest of county	935	483	452	922	13
69 LEWIS COUNTY	489	256	233	482	7
70 LIVINGSTON COUNTY	686	358	328	685	1
71 MADISON COUNTY	828	427	401	822	6
72 Oneida	296	159	137	295	1
73 Rest of county	532	268	264	527	5
74 MONROE COUNTY	7,688	3,903	3,785	7,612	76
75 Rochester	6,732	3,409	3,323	6,665	67
76 Rest of county	956	494	462	947	9
77 MONTGOMERY COUNTY	1,271	640	631	1,263	8
78 Amsterdam	835	416	419	831	4
79 Rest of county	436	224	212	432	4
80 NASSAU COUNTY	2,788	1,418	1,370	2,767	21
81 Glen Cove	233	113	120	233	....
82 Rest of county	2,555	1,305	1,250	2,534	21
83 NIAGARA COUNTY	2,928	1,520	1,408	2,914	14
84 Lockport	417	198	219	415	2
85 Niagara Falls	1,550	786	764	1,541	9
86 North Tonawanda	414	232	182	414	....
87 Rest of county	547	304	243	544	3
88 ONEIDA COUNTY	4,325	2,217	2,108	4,292	33
89 Rome	691	351	340	678	13
90 Utica	2,442	1,243	1,199	2,428	14
91 Sherrill	22	14	8	21	1
92 Rest of county	1,170	609	561	1,165	5
93 ONONDAGA COUNTY	5,418	2,801	2,617	5,344	74
94 Syracuse	4,191	2,202	1,989	4,120	71
95 Rest of county	1,227	599	628	1,224	3
96 ONTARIO COUNTY	1,094	575	519	1,087	7
97 Canandaigua	216	116	100	216	....
98 Geneva	378	188	190	375	3
99 Rest of county	500	271	229	496	4
100 ORANGE COUNTY	2,365	1,218	1 147	2,357	8
101 Middletown	310	165	145	305	5
102 Newburgh	675	352	323	675	....
103 Port Jervis	249	126	123	249	....
104 Rest of county	1,131	575	556	1,128	3

births in each city and the rest of each county in the State, during 1920, *classified by sex, birth; also month of occurrence* — (Continued)

DISTRICT	Single and Plural			Attendant at Birth			
	Single births	Twins	Trip-lets or more	Physi-cians	Mid-wives	Others	None or not stated
53 FRANKLIN COUNTY	1,068	28	....	1,035	56	3	2
54 FULTON COUNTY	838	8	....	826	5	13	2
55 Gloversville	441	2	....	440	1	1	1
56 Johnstown	180	4	....	183	....	1	....
57 Rest of county	217	2	....	203	4	11	1
58 GENESEE COUNTY	766	12	....	768	2	4	4
59 Batavia	342	6	....	347	....	1	....
60 Rest of county	424	6	....	421	2	3	4
61 GREENE COUNTY	430	6	....	422	5	8	1
62 HAMILTON COUNTY	79	....	....	75	4	....	....
63 HERKIMER COUNTY	1,407	29	....	1,215	205	16	....
64 Little Falls	342	10	....	257	94	1	....
65 Rest of county	1,065	19	....	958	111	15	....
66 JEFFERSON COUNTY	1,681	41	....	1,694	6	21	1
67 Watertown	764	23	....	774	1	12	....
68 Rest of county	917	18	....	920	5	9	1
69 LEWIS COUNTY	481	8	....	475	5	8	1
70 LIVINGSTON COUNTY	678	8	....	647	36	2	1
71 MADISON COUNTY	811	17	....	818	3	7	....
72 Oneida	287	9	....	296	....	....	....
73 Rest of county	524	8	....	522	3	7	....
74 MONROE COUNTY	7,518	167	3	7,157	412	105	14
75 Rochester	6,573	156	3	6,221	402	95	14
76 Rest of county	945	11	....	936	10	10	....
77 MONTGOMERY COUNTY	1,238	33	....	994	272	5	....
78 Amsterdam	814	21	....	569	263	3	....
79 Rest of county	424	12	....	425	9	2	....
80 NASSAU COUNTY	2,733	55	....	2,468	312	8	....
81 Glen Cove	232	1	....	163	69	1	....
82 Rest of county	2,501	54	....	2,305	243	7	....
83 NIAGARA COUNTY	2,867	61	....	2,409	506	11	2
84 Lockport	410	7	....	411	6	....	....
85 Niagara Falls	1,517	33	....	1,224	316	9	1
86 North Tonawanda	403	11	....	233	181	....	....
87 Rest of county	537	10	....	541	3	2	1
88 ONEIDA COUNTY	4,242	83	....	3,186	1,114	24	1
89 Rome	674	17	....	434	249	8	....
90 Utica	2,404	38	....	1,662	776	4	....
91 Sherrill	22	....	....	22	....	....	....
92 Rest of county	1,142	28	....	1,068	89	12	1
93 ONONDAGA COUNTY	5,321	97	....	4,944	450	22	2
94 Syracuse	4,117	74	....	3,806	382	3	....
95 Rest of county	1,204	23	....	1,138	68	19	2
96 ONTARIO COUNTY	1,062	32	....	1,083	1	10	....
97 Canandaigua	211	5	....	215	....	1	....
98 Geneva	362	16	....	369	....	9	....
99 Rest of county	489	11	....	499	1	....	....
100 ORANGE COUNTY	2,321	44	....	2,214	117	32	2
101 Middletown	302	8	....	307	....	2	1
102 Newburgh	663	12	....	613	61	1	....
103 Port Jervis	247	2	....	234	6	9	....
104 Rest of county	1,109	22	....	1,060	50	20	1

Table 25 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Number of legitimacy, plural births, attendant at*

DISTRICT	Births Occurring in —					
	Jan.	Feb.	Mar.	April	May	June
53 FRANKLIN COUNTY	**82**	**100**	**63**	**110**	**96**	**100**
54 FULTON COUNTY	**73**	**70**	**75**	**72**	**79**	**77**
55 Gloversville	42	37	33	33	43	38
56 Johnstown	15	19	19	20	15	17
57 Rest of county	16	14	23	19	21	22
58 GENESEE COUNTY	**68**	**70**	**73**	**78**	**44**	**55**
59 Batavia	31	35	42	30	20	21
60 Rest of county	37	35	31	48	24	34
61 GREENE COUNTY	**36**	**39**	**33**	**41**	**33**	**33**
62 HAMILTON COUNTY	**10**	**5**	**5**	**10**	**7**	**6**
63 HERKIMER COUNTY	**118**	**123**	**122**	**116**	**136**	**118**
64 Little Falls	35	36	28	23	29	31
65 Rest of county	83	87	94	93	107	87
66 JEFFERSON COUNTY	**129**	**134**	**139**	**134**	**165**	**135**
67 Watertown	48	65	67	61	72	55
68 Rest of county	81	69	72	73	93	80
69 LEWIS COUNTY	**40**	**32**	**44**	**41**	**42**	**38**
70 LIVINGSTON COUNTY	**44**	**65**	**66**	**60**	**61**	**60**
71 MADISON COUNTY	**59**	**68**	**72**	**69**	**72**	**75**
72 Oneida	23	21	26	21	24	24
73 Rest of county	36	47	46	48	48	51
74 MONROE COUNTY	**654**	**653**	**713**	**673**	**647**	**624**
75 Rochester	578	570	639	593	574	538
76 Rest of county	76	83	74	80	73	86
77 MONTGOMERY COUNTY	**86**	**111**	**117**	**99**	**109**	**110**
78 Amsterdam	62	74	84	59	64	67
79 Rest of county	24	37	33	40	45	43
80 NASSAU COUNTY	**258**	**238**	**255**	**228**	**233**	**212**
81 Glen Cove	23	30	25	19	22	23
82 Rest of county	235	208	230	209	211	189
83 NIAGARA COUNTY	**265**	**203**	**279**	**198**	**271**	**238**
84 Lockport	48	30	27	24	33	29
85 Niagara Falls	124	97	163	99	152	126
86 North Tonawanda	39	31	36	31	30	34
87 Rest of county	54	45	53	44	56	49
88 ONEIDA COUNTY	**368**	**355**	**352**	**364**	**347**	**360**
89 Rome	50	59	54	65	53	57
90 Utica	230	186	196	197	195	198
91 Sherrill	2	4	1	1	1	2
92 Rest of county	86	106	101	101	98	108
93 ONONDAGA COUNTY	**474**	**448**	**506**	**476**	**438**	**452**
94 Syracuse	360	345	399	369	352	346
95 Rest of county	115	103	107	107	86	106
96 ONTARIO COUNTY	**104**	**98**	**100**	**96**	**93**	**91**
97 Canandaigua	23	18	17	18	16	18
98 Geneva	35	38	44	31	34	35
99 Rest of county	46	42	39	47	43	48
100 ORANGE COUNTY	**221**	**194**	**206**	**171**	**219**	**210**
101 Middletown	34	26	22	28	35	22
102 Newburgh	62	63	59	41	58	61
103 Port Jervis	21	17	30	19	21	24
104 Rest of county	104	88	95	83	105	108

births in each city and the rest of each county in the State, during 1920, classified by sex, birth; also month of occurrence — (Continued)

DISTRICT	BIRTHS OCCURRING IN —					
	July	Aug.	Sept.	Oct.	Nov.	Dec.
53 FRANKLIN COUNTY	103	89	106	75	73	99
54 FULTON COUNTY	79	73	61	69	60	58
55 Gloversville	36	43	34	42	32	30
56 Johnstown	16	15	10	14	10	14
57 Rest of county	27	15	17	13	18	14
58 GENESEE COUNTY	75	76	80	61	51	47
59 Batavia	31	31	30	24	28	25
60 Rest of county	44	45	50	37	23	22
61 GREENE COUNTY	56	40	36	34	30	25
62 HAMILTON COUNTY	8	9	2	6	6	5
63 HERKIMER COUNTY	131	133	144	100	92	103
64 Little Falls	29	35	34	30	20	22
65 Rest of county	102	98	110	70	72	81
66 JEFFERSON COUNTY	181	169	139	134	119	144
67 Watertown	93	74	59	57	62	74
68 Rest of county	8	95	80	77	57	70
69 LEWIS COUNTY	39	47	39	44	44	39
70 LIVINGSTON COUNTY	70	56	67	43	45	49
71 MADISON COUNTY	79	79	91	55	60	49
72 Oneida	28	30	36	22	23	18
73 Rest of county	51	49	55	33	37	31
74 MONROE COUNTY	647	688	597	618	586	588
75 Rochester	564	595	513	549	517	502
76 Rest of county	83	93	84	69	69	86
77 MONTGOMERY COUNTY	114	126	110	112	89	88
78 Amsterdam	71	83	80	73	57	61
79 Rest of county	43	43	30	39	32	27
80 NASSAU COUNTY	241	245	239	233	190	216
81 Glen Cove	9	13	23	16	15	15
82 Rest of county	232	232	216	217	175	201
83 NIAGARA COUNTY	256	257	270	231	241	219
84 Lockport	31	45	45	38	33	34
85 Niagara Falls	143	124	149	127	132	114
86 North Tonawanda	36	52	33	24	37	31
87 Rest of county	46	36	43	42	39	40
88 ONEIDA COUNTY	402	401	395	324	314	343
89 Rome	62	65	66	50	59	51
90 Utica	254	231	216	170	173	201
91 Sherrill	1	3	......	2	1	4
92 Rest of county	85	102	113	102	81	87
93 ONONDAGA COUNTY	460	479	433	413	410	428
94 Syracuse	365	360	338	302	320	335
95 Rest of county	95	119	95	111	90	93
96 ONTARIO COUNTY	87	111	90	80	69	75
97 Canandaigua	19	19	23	14	22	14
98 Geneva	24	36	27	27	24	23
99 Rest of county	44	56	40	39	23	38
100 ORANGE COUNTY	197	213	218	167	165	184
101 Middletown	23	30	19	30	19	22
102 Newburgh	60	73	64	46	46	42
103 Port Jervis	19	14	21	22	21	20
104 Rest of county	95	96	114	69	79	100

Table 25 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Number of legitimacy, plural births, attendant at*

	DISTRICT	Total living births	Sex		Legitimacy	
			Males	Females	Legitimate	Illegitimate
105	ORLEANS COUNTY	547	296	251	543	4
106	OSWEGO COUNTY	1,547	801	746	1,540	7
107	Fulton	316	152	164	313	3
108	Oswego	565	324	241	562	3
109	Rest of county	666	325	341	665	1
110	OTSEGO COUNTY	818	425	393	814	4
111	Oneonta	254	141	113	253	1
112	Rest of county	564	284	280	561	3
113	PUTNAM COUNTY	230	124	106	227	3
114	RENSSELAER COUNTY	1,947	984	963	1,930	17
115	Rensselaer	101	51	50	100	1
116	Troy	1,385	713	672	1,372	13
117	Rest of county	461	220	241	458	3
118	ROCKLAND COUNTY	884	481	403	876	8
119	ST. LAWRENCE COUNTY	1,967	994	973	1,940	27
120	Ogdensburg	327	162	165	322	5
121	Rest of county	1,640	832	808	1,618	22
122	SARATOGA COUNTY	1,193	602	591	1,188	5
123	Saratoga Springs	273	127	146	272	1
124	Mechanicville	194	100	94	194	....
125	Rest of county	726	375	351	722	4
126	SCHENECTADY COUNTY	2,332	1,210	1,122	2,317	15
127	Schenectady	1,968	1,015	953	1,954	14
128	Rest of county	364	195	169	363	1
129	SCHOHARIE COUNTY	377	198	179	372	5
130	SCHUYLER COUNTY	256	133	123	255	1
131	SENECA COUNTY	415	217	198	413	2
132	STEUBEN COUNTY	1,683	882	801	1,675	8
133	Corning	427	203	224	426	1
134	Hornell	295	147	148	295	....
135	Rest of county	961	532	429	954	7
136	SUFFOLK COUNTY	2,142	1,114	1,028	2,125	17
137	SULLIVAN COUNTY	539	284	255	535	4
138	TIOGA COUNTY	416	225	191	399	17
139	TOMPKINS COUNTY	684	351	333	681	3
140	Ithaca	350	173	177	348	2
141	Rest of county	334	178	156	333	1
142	ULSTER COUNTY	1,282	668	614	1,269	13
143	Kingston	496	246	250	493	3
144	Rest of county	786	422	364	776	10
145	WARREN COUNTY	680	371	309	671	9
146	Glens Falls	401	223	178	400	1
147	Rest of county	279	148	131	271	8
148	WASHINGTON COUNTY	810	409	401	805	5
149	WAYNE COUNTY	864	444	420	855	9
150	WESTCHESTER COUNTY	7,379	3,787	3,592	7,309	70
151	Peekskill, village	335	168	167	328	7
152	White Plains	477	227	250	470	7

births in each city and the rest of each county in the State, during 1920, *classified by sex, birth; also month of occurrence* — (Continued)

DISTRICT	Single and Plural			Attendant at Birth			
	Single births	Twins	Triplets or more	Physicians	Midwives	Others	None or not stated
105 ORLEANS COUNTY	539	8	....	532	10	4	1
106 OSWEGO COUNTY	1,519	28	....	1,482	51	14	....
107 Fulton	308	8	....	313	1	2	....
108 Oswego	556	9	....	520	39	6	....
109 Rest of county	655	11	....	649	11	6	....
110 OTSEGO COUNTY	792	26	....	804	3	11	....
111 Oneonta	252	2	....	252	1	1	....
112 Rest of county	540	24	....	552	2	10	....
113 PUTNAM COUNTY	226	4	....	226	1	3	....
114 RENSSELAER COUNTY	1,900	47	....	1,794	147	6	....
115 Rensselaer	98	3	....	96	5	....	....
116 Troy	1,355	30	....	1,246	138	1	....
117 Rest of county	447	14	....	452	4	5	....
118 ROCKLAND COUNTY	858	26	....	843	38	3	....
119 ST. LAWRENCE COUNTY	1,913	54	....	1,898	48	21	....
120 Ogdensburg	316	11	....	324	2	1	....
121 Rest of county	1,597	43	....	1,574	46	20	....
122 SARATOGA COUNTY	1,178	13	2	1,110	66	17	....
123 Saratoga Springs	268	3	2	242	31	....	....
124 Mechanicville	194	....	....	190	1	3	....
125 Rest of county	716	10	....	678	34	14	....
126 SCHENECTADY COUNTY	2,283	49	....	1,677	647	8	....
127 Schenectady	1,925	43	....	1,371	593	4	....
128 Rest of county	358	6	....	306	54	4	....
129 SCHOHARIE COUNTY	365	12	....	363	4	10	....
130 SCHUYLER COUNTY	248	8	....	255	....	1	....
131 SENECA COUNTY	407	8	....	407	....	7	1
132 STEUBEN COUNTY	1,632	51	....	1,675	2	6	....
133 Corning	416	11	....	426	....	1	....
134 Hornell	282	13	....	295	....	....	....
135 Rest of county	934	27	....	954	2	5	....
136 SUFFOLK COUNTY	2,097	45	....	2,027	103	12	....
137 SULLIVAN COUNTY	528	8	3	493	34	11	1
138 TIOGA COUNTY	410	6	....	410	1	4	1
139 TOMPKINS COUNTY	665	19	....	670	3	9	2
140 Ithaca	339	11	....	350	....	....	....
141 Rest of county	326	8	....	320	3	9	2
142 ULSTER COUNTY	1,262	20	....	1,228	37	14	3
143 Kingston	484	12	....	482	10	4	....
144 Rest of county	778	8	....	746	27	10	3
145 WARREN COUNTY	666	14	....	663	8	9	....
146 Glens Falls	397	4	....	401	....	....	....
147 Rest of county	269	10	....	262	8	9	....
148 WASHINGTON COUNTY	786	24	....	787	16	6	1
149 WAYNE COUNTY	855	9	....	846	11	6	1
150 WESTCHESTER COUNTY	7,210	169	....	5,566	1,776	25	12
151 Peekskill, village	327	8	....	308	23	4	....
152 White Plains	469	8	....	406	70	....	1

Table 25 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Number of legitimacy, plural births, attendant at*

DISTRICT	BIRTHS OCCURRING IN — Jan.	Feb.	Mar.	April	May	June
105 ORLEANS COUNTY	**46**	**46**	**48**	**42**	**46**	**38**
106 OSWEGO COUNTY	**131**	**122**	**130**	**128**	**150**	**125**
107 Fulton	31	26	19	32	23	22
108 Oswego	55	40	53	33	59	52
109 Rest of county	45	56	58	63	68	51
110 OTSEGO COUNTY	**82**	**73**	**69**	**48**	**63**	**64**
111 Oneonta	19	24	26	17	15	27
112 Rest of county	63	49	43	31	48	37
113 PUTNAM COUNTY	**14**	**19**	**19**	**25**	**26**	**19**
114 RENSSELAER COUNTY	**152**	**167**	**176**	**164**	**164**	**201**
115 Rensselaer	9	6	5	5	9	17
116 Troy	111	104	133	116	111	139
117 Rest of county	32	57	38	43	44	45
118 ROCKLAND COUNTY	**60**	**69**	**76**	**76**	**91**	**58**
119 ST. LAWRENCE COUNTY	**153**	**185**	**192**	**174**	**180**	**187**
120 Ogdensburg	29	27	30	26	30	27
121 Rest of county	124	158	162	148	150	160
122 SARATOGA COUNTY	**91**	**90**	**95**	**102**	**107**	**122**
123 Saratoga Springs	21	18	23	22	23	24
124 Mechanicville	6	20	18	18	14	18
125 Rest of county	64	52	54	62	70	80
126 SCHENECTADY COUNTY	**192**	**218**	**232**	**181**	**195**	**207**
127 Schenectady	162	184	200	150	161	170
128 Rest of county	30	34	32	31	34	37
129 SCHOHARIE COUNTY	**35**	**29**	**28**	**33**	**31**	**26**
130 SCHUYLER COUNTY	**24**	**25**	**30**	**19**	**16**	**19**
131 SENECA COUNTY	**35**	**43**	**31**	**31**	**35**	**31**
132 STEUBEN COUNTY	**139**	**144**	**160**	**136**	**132**	**159**
133 Corning	40	38	47	35	36	38
134 Hornell	27	32	25	19	21	26
135 Rest of county	72	74	88	82	75	95
136 SUFFOLK COUNTY	**190**	**166**	**176**	**172**	**203**	**187**
137 SULLIVAN COUNTY	**36**	**35**	**53**	**50**	**44**	**53**
138 TIOGA COUNTY	**37**	**37**	**37**	**43**	**38**	**33**
139 TOMPKINS COUNTY	**50**	**65**	**71**	**59**	**64**	**42**
140 Ithaca	25	26	28	36	31	25
141 Rest of county	25	39	43	23	33	17
142 ULSTER COUNTY	**100**	**101**	**94**	**118**	**105**	**110**
143 Kingston	42	34	41	39	45	47
144 Rest of county	58	67	53	79	60	63
145 WARREN COUNTY	**64**	**58**	**53**	**60**	**46**	**49**
146 Glens Falls	30	35	35	32	24	35
147 Rest of county	34	23	18	28	22	14
148 WASHINGTON COUNTY	**69**	**77**	**76**	**64**	**70**	**55**
149 WAYNE COUNTY	**81**	**78**	**69**	**72**	**76**	**66**
150 WESTCHESTER COUNTY	**652**	**669**	**627**	**604**	**628**	**583**
151 Peekskill, village	30	34	27	32	26	25
152 White Plains	42	41	37	38	50	36

births in each city and the rest of each county in the State, during 1920, classified by sex birth; also month of occurrence — (Continued)

	DISTRICT	Births Occurring in —					
		July	Aug.	Sept.	Oct.	Nov.	Dec.
105	**Orleans County**	**54**	**43**	**63**	**40**	**38**	**43**
106	**Oswego County**	**138**	**145**	**141**	**120**	**112**	**105**
107	Fulton	34	33	25	24	18	29
108	Oswego	42	49	50	50	43	39
109	Rest of county	62	63	66	46	51	37
110	**Otsego County**	**73**	**70**	**64**	**76**	**62**	**74**
111	Oneonta	16	19	21	19	24	27
112	Rest of county	57	51	43	57	38	47
113	**Putnam County**	**20**	**25**	**19**	**18**	**14**	**12**
114	**Rensselaer County**	**142**	**154**	**182**	**154**	**129**	**162**
115	Rensselaer	6	7	5	12	7	13
116	Troy	100	110	141	111	95	114
117	Rest of county	36	37	36	31	27	35
118	**Rockland County**	**101**	**81**	**78**	**68**	**60**	**66**
119	**St. Lawrence County**	**141**	**177**	**156**	**164**	**103**	**155**
120	Ogdensburg	17	36	37	24	20	24
121	Rest of county	124	141	119	140	83	131
122	**Saratoga County**	**121**	**93**	**93**	**99**	**94**	**86**
123	Saratoga Springs	33	20	28	20	22	19
124	Mechanicville	19	16	23	16	15	11
125	Rest of county	69	57	42	63	57	56
126	**Schenectady County**	**218**	**184**	**171**	**171**	**189**	**174**
127	Schenectady	185	153	152	143	163	145
128	Rest of county	33	31	19	28	26	29
129	**Schoharie County**	**32**	**37**	**31**	**37**	**32**	**26**
130	**Schuyler County**	**18**	**25**	**16**	**23**	**17**	**24**
131	**Seneca County**	**32**	**26**	**40**	**41**	**39**	**31**
132	**Steuben County**	**153**	**138**	**143**	**138**	**107**	**134**
133	Corning	30	23	40	41	25	34
134	Hornell	22	22	27	22	23	29
135	Rest of county	101	93	76	75	59	71
136	**Suffolk County**	**197**	**194**	**175**	**180**	**149**	**153**
137	**Sullivan County**	**57**	**58**	**33**	**47**	**39**	**34**
138	**Tioga County**	**28**	**34**	**30**	**31**	**30**	**38**
139	**Tompkins County**	**65**	**57**	**56**	**54**	**45**	**56**
140	Ithaca	30	28	31	28	31	31
141	Rest of county	35	29	25	26	14	25
142	**Ulster County**	**121**	**113**	**101**	**104**	**107**	**108**
143	Kingston	46	45	33	46	41	37
144	Rest of county	75	68	68	58	66	71
145	**Warren County**	**73**	**56**	**71**	**62**	**51**	**37**
146	Glens Falls	45	32	41	39	26	27
147	Rest of county	28	24	30	23	25	10
148	**Washington County**	**68**	**70**	**87**	**65**	**53**	**56**
149	**Wayne County**	**87**	**78**	**58**	**78**	**48**	**73**
150	**Westchester County**	**643**	**648**	**597**	**573**	**578**	**577**
151	Peekskill, village	27	28	27	26	28	25
152	White Plains	42	42	44	26	39	40

Table 25 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Number of legitimacy, plural births, attendant at*

	DISTRICT	Total living births	Sex		Legitimacy	
			Males	Females	Legiti-mate	Illegiti-mate
	WESTCHESTER Co. — (*Concluded*)					
153	Mt. Vernon	956	494	462	953	3
154	New Rochelle	673	351	322	663	10
155	Ossining, village	228	121	107	227	1
156	Port Chester, village	545	277	268	542	3
157	Yonkers	2,399	1,252	1,147	2,369	30
158	Rest of county	1,766	897	869	1,757	9
159	WYOMING COUNTY	554	293	261	550	4
160	YATES COUNTY	254	130	124	253	1

births in each city and the rest of each county in the State, during 1920, classified by sex birth; also month of occurrence — (Continued)

DISTRICT	SINGLE AND PLURAL			ATTENDANT AT BIRTH			
	Single births	Twins	Trip-lets or more	Physi-cians	Mid-wives	Others	None or not stated
153 Mt. Vernon	934	22	....	662	293	....	1
154 New Rochelle	658	15	....	531	141	1	....
155 Ossining, village	219	9	....	200	28	....	....
156 Port Chester, village	536	9	....	337	208	....	....
157 Yonkers	2,345	54	....	1,710	679	2	8
158 Rest of county	1,722	44	....	1,412	334	18	2
159 WYOMING COUNTY	544	10	....	548	3	3	....
160 YATES COUNTY	248	6	....	253	1	....	....

Table 25 — NEW YORK STATE, NEW YORK CITY, and REST OF STATE: *Number of legitimacy, plural births, attendant at*

DISTRICT	Births Occurring in —					
	Jan.	Feb.	Mar.	April	May	June
WESTCHESTER CO. — (*Concluded*)						
153 Mt. Vernon	96	91	85	82	80	71
154 New Rochelle	59	55	46	61	62	50
155 Ossining, village	20	16	17	16	18	15
156 Port Chester, village	50	53	54	46	49	42
157 Yonkers	205	221	214	178	209	205
158 Rest of county	150	158	147	151	134	180
159 WYOMING COUNTY	47	46	54	54	43	44
160 YATES COUNTY	22	24	19	24	36	17

births in each city and the rest of each county in the State, during 1920, *classified by sex, birth; also month of occurrence* — (Concluded)

DISTRICT	Births Occurring in — July	Aug.	Sept.	Oct.	Nov.	Dec.
153 Mt. Vernon	81	83	71	76	71	69
154 New Rochelle	64	58	55	56	51	56
155 Ossining, village	28	17	21	17	23	20
156 Port Chester, village	40	52	30	53	40	36
157 Yonkers	205	224	196	177	180	185
158 Rest of county	156	144	153	142	146	146
159 WYOMING COUNTY	50	37	50	44	33	52
160 YATES COUNTY	23	20	18	18	16	17

BIRTH STATISTICS

AND

INFANT MORTALITY, 1920

Table I.— DEATHS (exclusive of stillbirths) *by age, sex, color, general nativity*
New York

Line number	AGE AT DEATH	Sex	Total deaths (stillbirths excluded)	WHITE							
				Total white deaths	NATIVITY OF						
					Native	Total foreign born	Country				
							England, Scotland, Wales	Ireland	Germany	German Poland
1	**Total deaths—all ages**	M	**36,458**	**35,899**	**27,488**	**8,091**	**982**	**1,497**	**1,758**	**11**
		F	**34,759**	**34,256**	**26,533**	**7,574**	**987**	**1,919**	**1,613**	**13**
2	Under 1 year	M	5,164	5,090	5,078	10	1	....	....	...
		F	3,822	3,758	3,745	8	....	....	....	...
3	1 year old	M	879	863	859	4	....	....	....	...
		F	714	689	685	4	....	....	....	...
4	2 years old	M	394	382	379	3	....	....	....	...
		F	357	347	344	2	....	....	....	...
5	3 years old	M	276	272	269	2	....	....	....	...
		F	280	276	274	2	....	....	....	...
6	4 years old	M	207	206	202	4	....	....	....	...
		F	203	203	201	2	....	....	....	...
7	**Total under 5 years**	M	**6,920**	**6,813**	**6,787**	**23**	**1**	....	....	...
		F	**5,376**	**5,273**	**5,249**	**18**	....	....	....	...
8	5 to 9 years old	M	709	697	681	15	1	....	1	...
		F	604	595	575	19	2	....	1	...
9	10 to 14 years old	M	513	502	476	26	6	....	....	...
		F	410	404	378	26	1	....	....	...
10	15 to 19 years old	M	702	688	623	59	7	1	2	...
		F	626	600	545	53	1	....	1	...
11	20 to 24 years old	M	916	879	740	129	8	3	6	...
		F	1,027	1,001	856	145	8	9	4	...
12	25 to 29 years old	M	1,214	1,178	857	308	14	10	9	...
		F	1,262	1,228	980	246	16	18	6	...
13	30 to 34 years old	M	1,342	1,317	921	386	23	20	28	...
		F	1,326	1,287	982	304	27	28	18	...
14	35 to 39 years old	M	1,456	1,416	965	436	26	29	31	1
		F	1,212	1,174	875	293	28	37	19	...
15	40 to 44 years old	M	1,490	1,457	1,000	435	29	45	43	2
		F	1,170	1,156	858	288	25	42	35	...
16	45 to 49 years old	M	1,602	1,566	1,034	508	47	46	68	3
		F	1,426	1,397	1,052	335	45	60	49	1
17	50 to 54 years old	M	1,906	1,871	1,252	598	69	69	112	2
		F	1,786	1,760	1,270	477	59	92	108	3
18	55 to 59 years old	M	2,191	2,170	1,490	657	86	114	129	2
		F	2,036	2,005	1,444	551	61	104	111	1
19	60 to 64 years old	M	2,744	2,714	1,917	751	86	133	211	...
		F	2,513	2,483	1,836	639	79	174	115	3
20	65 to 69 years old	M	3,063	3,032	2,237	770	115	177	205	...
		F	2,869	2,850	2,051	790	108	227	185	2
21	70 to 74 years old	M	3,075	3,042	2,068	950	134	280	271	1
		F	3,181	3,144	2,139	981	147	333	267	1
22	75 to 79 years old	M	2,988	2,959	2,037	895	145	254	270	...
		F	3,217	3,199	2,180	1,002	163	330	281	1
23	80 to 84 years old	M	2,062	2,044	1,392	634	105	169	206	...
		F	2,470	2,463	1,718	729	104	247	228	1
24	85 to 89 years old	M	1,109	1,106	744	352	58	92	119	...
		F	1,548	1,543	1,084	453	87	134	130	...
25	90 to 94 years old	M	354	351	219	131	17	42	42	...
		F	525	523	356	166	27	57	47	...
26	95 to 99 years old	M	60	59	36	23	4	10	5	...
		F	123	121	79	41	4	18	7	...
27	100 years and over	M	9	7	5	2	1	1	....	...
		F	16	15	9	5	....	3	....	...
28	Age unknown or not stated.	M	33	31	7	3	....	2	....	...
		F	36	35	17	13	....	6	1	...

and by the country of birth of foreign-born in the State of New York (exclusive of City): 1920

DECEDENTS														COLORED DECEDENTS				
WHITE DECEDENTS																		
of birth of foreign-born decedents																		
Italy	Russia	Russian Poland	Austria	Austrian Poland	Hungary	Poland, unspecified	Total, Poland	Canada (French)	Canada (other)	Total, Canada	Norway, Sweden, Denmark	Other foreign countries	Country not stated	Total, colored	Negro	American Indian	Chinese, Japanese and others	Line number
858	380	77	328	32	85	457	577	155	758	908	246	472	320	559	509	33	17	1
604	240	26	184	30	77	322	391	145	878	1.023	197	339	149	503	461	42	....	
3	1	....	....	....	....	....	....	2	8	5	....	....	2	74	72	2	....	2
2	....	....	....	....	....	....	....	1	4	5	....	1	5	64	60	4	....	
1	....	....	....	....	....	....	....	1	1	2	....	1	....	16	14	1	1	3
2	....	....	....	....	....	....	....	....	1	1	....	1	....	25	21	4	....	
....	....	....	....	....	....	....	....	....	8	8	....	....	....	12	9	3	....	4
....	....	....	....	....	....	....	....	....	2	2	....	....	1	10	8	2	....	
1	....	....	....	....	....	....	....	....	....	....	....	1	1	4	3	1	....	5
....	....	....	....	....	....	....	....	....	2	2	....	....	....	4	3	1	....	
2	....	....	....	....	....	....	....	....	1	1	1	....	....	1	1	....	....	6
....	....	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	
7	1	....	....	....	....	....	....	3	8	11	1	2	3	107	99	7	1	7
4	....	....	....	....	....	....	....	1	11	12	....	2	6	103	92	11	....	
5	1	....	1	....	....	....	....	....	4	4	....	2	1	12	11	1	....	8
3	....	....	1	....	....	1	1	2	8	10	....	1	1	9	8	1	....	
9	....	1	1	....	....	3	4	....	3	3	1	2	....	11	10	1	....	9
12	1	1	1	....	....	3	4	....	6	6	1	....	....	6	5	1	....	
16	4	....	3	....	....	1	1	2	7	9	1	15	6	14	9	5	....	10
22	2	....	4	....	4	10	10	....	6	6	1	2	2	26	23	3	....	
44	14	2	10	3	....	5	10	3	8	11	5	18	10	37	35	1	1	11
38	16	2	9	2	8	19	23	3	14	17	7	11	....	26	21	5	....	
65	39	9	41	6	5	42	57	6	13	19	8	41	13	36	29	2	5	12
49	31	3	20	10	5	39	52	7	20	27	2	20	2	34	34	....	....	
96	49	8	28	5	8	42	55	4	24	28	13	38	10	25	23	1	1	13
70	22	2	29	8	6	39	49	2	30	32	11	12	1	39	37	2	....	
103	44	24	32	3	8	58	86	6	28	34	12	31	15	40	38	1	1	14
56	21	2	15	3	4	38	43	6	33	39	13	18.	6	38	38	....	....	
80	26	3	50	4	11	65	74	4	34	38	13	26	22	33	31	1	1	15
41	17	3	12	2	9	20	25	8	47	55	9	18	10	14	13	1	....	
80	42	7	29	5	14	66	81	10	42	52	20	29	24	36	34	1	1	16
30	17	2	11	1	9	24	28	5	52	57	12	17	10	29	26	3	....	
86	40	5	28	3	17	49	59	10	64	74	19	25	21	35	33	1	1	17
41	16	1	18	....	8	27	31	9	64	73	13	18	13	26	26	....	....	
66	24	10	32	2	7	43	57	14	64	78	28	36	23	21	19	1	1	18
49	31	3	17	1	5	34	39	7	83	90	17	27	10	31	28	3	....	
76	32	4	23	1	8	29	34	13	81	94	31	23	46	30	25	2	3	19
55	25	....	19	....	4	20	23	14	94	108	15	22	8	30	27	3	....	
57	23	2	20	....	3	19	21	14	78	92	23	34	25	31	31	....	....	20
48	15	3	8	1	10	19	25	18	97	115	23	26	9	19	17	2	....	
31	18	1	18	....	1	16	18	18	88	106	26	47	24	33	32	1	....	21
35	14	2	7	....	3	10	13	11	93	104	25	33	24	37	35	2	....	
21	9	....	6	....	2	12	12	22	89	111	22	43	27	29	23	5	1	22
29	4	1	7	1	....	8	11	15	96	111	19	47	17	18	14	4	....	
12	9	1	5	....	1	1	2	12	68	80	12	33	18	18	17	1	....	23
12	5	1	2	1	1	5	8	14	55	69	17	36	16	7	6	1	....	
1	4	....	1	....	....	4	4	11	40	51	7	15	10	3	3	....	....	24
6	1	....	....	....	1	4	4	10	55	65	8	17	6	5	5	....	....	
3	1	....	....	....	....	1	1	3	7	10	4	11	1	3	3	....	....	25
1	1	....	2	....	....	1	1	10	12	22	2	6	1	2	2	....	....	
....	....	....	....	....	....	....	....	....	3	3	....	1	....	1	....	1	....	26
....	1	....	....	....	....	1	1	3	2	5	1	4	1	2	2	....	....	
....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	....	27
....	....	....	1	....	....	....	....	....	....	....	....	1	1	1	1	....	....	
....	....	....	....	....	....	1	1	....	....	....	....	....	21	2	2	....	....	28
3	....	....	1	....	....	....	....	....	....	....	1	1	5	1	1	....	....	

Table II.— BIRTHS (exclusive of stillbirths) *to native white mothers by age of mother* (exclusive of New York City) *grouped*

AGE OF MOTHER	Total children born 1920	NUMBER			
		1st	2d	3d	4th
Villages with less than 2,500 population Total children	**4,494**	**1,413**	**1,114**	**739**	**444**
15 years or less	6	6	....	....	....
16 years	20	19	1	....	....
17 years	50	46	4	....	....
18 years	111	94	13	3	....
19 years	167	125	33	8	1
20 years	233	160	57	13	2
21 years	252	131	77	38	5
22 years	245	115	86	33	9
23 years	288	111	94	68	14
24 years	296	119	90	51	26
25 years	276	102	93	47	24
26 years	297	77	111	56	33
27 years	244	62	80	57	15
28 years	240	56	64	51	33
29 years	228	43	48	46	42
30 years	206	37	58	32	25
31 years	193	26	42	37	34
32 years	158	17	28	36	27
33 years	157	15	33	30	21
34 years	135	11	19	28	21
35 years	119	7	16	32	15
36 years	109	4	18	16	21
37 years	108	9	14	13	17
38 years	81	4	12	8	15
39 years	80	6	7	10	13
40 years	62	1	7	7	7
41 years	40	2	2	6	9
42 years	37	3	3	3	7
43 years	21	....	....	3	3
44 years	17	....	1	2	4
45 years	3	....	....	1	1
46 years	1	1	....	....	....
47 years	2	....	1	....	....
48 years	1	....	....	....	....
49 years	....	....	....	....	....
50 years and over	....	....	....	....	....
Age not stated	11	4	2	4	....

according to the number of child in order of birth, for cities, etc., of New York State according to size in population: **1920** — (Continued)

OF CHILD IN ORDER OF BIRTH											
5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th or over	Number of child not stated
345	**205**	**136**	**88**	**46**	**37**	**19**	**21**	**8**	**4**	......	**25**
.....	....	....	....	....	....	.....	.....	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	1
.....	....	....	....	....	....	.....	.....	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	2
.....	....	....	....	....	....	.....	.....	.....	.....	......	1
1	1	....	....	....	....	.....	.....	.....	.....	......	1
4	....	....	....	....	....	.....	.....	.....	.....	......	2
3	1	....	1	....	....	.....	.....	.....	.....	......	....
8	2	....	....	....	....	.....	.....	.....	.....	......	1
15	2	3	....	....	....	.....	.....	.....	.....	......	1
27	9	1	....	....	....	.....	.....	.....	.....	......	1
22	10	1	2	....	....	.....	.....	.....	.....	......	....
20	7	2	2	....	....	.....	.....	.....	.....	......	2
24	18	10	2	....	1	.....	.....	.....	.....	......	1
13	20	13	6	4	1	.....	.....	.....	.....	......	....
20	10	6	6	2	2	.....	.....	.....	.....	......	....
33	11	13	6	1	3	.....	.....	.....	.....	......	1
30	17	7	4	2	3	.....	.....	1	.....	......	2
23	17	16	8	1	1	.....	1	.....	.....	......	2
19	17	11	10	4	2	1	3	.....	.....	......	3
15	12	10	7	3	3	2	1	1	.....	......	2
16	12	5	6	6	4	2	3	.....	1	......	1
18	10	8	6	7	2	2	1	2	.....	......	....
10	8	13	5	5	4	1	1	.....	1	......	1
5	9	4	4	3	4	5	2	1	.....	......	....
8	4	3	5	2	3	1	4	2	1	......	....
5	3	5	1	2	2	2	1	.....	.....	......	....
1	2	2	3	3	....	2	1	.....	1	......	....
3	2	3	....	1	....	.....	2	1	.....	......	....
2	....	....	....	....	1	1	.....	.....	.....	......	....
.....	1	....	3	....	....	.....	.....	.....	.....	......	....
.....	....	....	....	....	1	.....	1	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	....
.....	....	....	1	....	....	.....	.....	.....	.....	......	....

Table II.— BIRTHS (exclusive of stillbirths) *to native white mothers by age of mother* (exclusive of New York City) *grouped*

AGE OF MOTHER	Total children born 1920	NUMBER			
		1st	2d	3d	4th
Towns					
Total children	**21,955**	**5,823**	**4,697**	**3,635**	**2,388**
15 years or less	34	34	....	....	....
16 years	121	113	8	....	....
17 years	285	251	30	2	....
18 years	547	471	64	10	....
19 years	846	601	203	34	3
20 years	1,060	637	302	104	12
21 years	1,091	526	383	144	28
22 years	1,291	536	433	242	60
23 years	1,277	472	421	247	94
24 years	1,244	376	369	279	147
25 years	1,279	339	376	283	154
26 years	1,313	308	344	290	189
27 years	1,214	233	286	278	189
28 years	1,134	202	256	242	188
29 years	1,041	148	221	215	175
30 years	989	115	185	203	162
31 years	877	89	157	197	141
32 years	909	77	141	162	151
33 years	818	68	106	144	128
34 years	788	56	95	127	123
35 years	586	47	79	96	77
36 years	620	45	67	82	84
37 years	542	20	51	73	70
38 years	531	21	43	63	60
39 years	380	11	22	36	40
40 years	345	8	21	36	36
41 years	244	5	9	15	33
42 years	204	4	11	10	20
43 years	127	2	5	6	9
44 years	78	....	3	4	5
45 years	57	....	....	2	7
46 years	26	1	....	2	....
47 years	11	1	....	2	....
48 years	7	....	....	....	2
49 years	5	....	....	....	....
50 years and over	3	....	....	....	....
Age not stated	31	6	6	5	1

according to the number of child in order of birth, for cities, etc., of New York State according to size in population: 1920 — (Continued)

OF CHILD IN ORDER OF BIRTH

5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th or over	Number of child not stated
252	**186**	**111**	**77**	**47**	**31**	**19**	**11**	**10**	**2**	**5**	**20**
.....	....	....	....	....	....	.....	.....	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	1
.....	....	....	....	....	....	.....	.....	.....	.....	......	1
.....	....	....	....	....	....	.....	.....	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	1
.....	2	....	....	....	....	.....	.....	.....	.....	......	2
2	1	....	....	....	....	.....	.....	.....	.....	......	....
4	....	....	....	....	....	.....	.....	.....	.....	......	....
9	3	....	....	....	....	.....	.....	.....	.....	......	1
12	2	....	2	....	....	.....	.....	.....	.....	......	1
18	6	3	....	....	....	.....	.....	.....	.....	......	....
12	12	4	2	....	....	.....	.....	.....	.....	......	....
25	5	7	1	....	1	.....	.....	.....	.....	......	1
18	16	7	1	....	1	.....	.....	.....	.....	......	....
8	12	6	2	2	....	.....	.....	.....	.....	......	3
18	15	4	4	1	2	.....	.....	.....	.....	......	2
22	12	5	3	1	1	2	.....	.....	.....	......	1
9	15	6	6	3	2	1	.....	.....	.....	......	1
13	16	10	10	4	5	3	2	.....	.....	......	3
19	14	9	5	5	....	.....	.....	.....	.....	......	....
13	11	11	7	4	2	.....	1	.....	1	......	....
10	10	8	8	1	....	2	1	.....	.....	......	....
9	8	4	7	5	5	2	1	1	1	......	2
10	7	3	7	12	3	1	.....	2	.....	2	....
5	5	5	5	2	1	6	1	2	.....	......	....
6	5	8	1	2	3	1	.....	1	.....	......	....
6	4	6	2	1	2	1	1	.....	.....	......	....
1	2	1	1	2	2	.....	1	1	.....	1	....
2	3	2	1	1	....	.....	2	.....	.....	......	....
.....	....	1	1	1	....	.....	.....	2	.....	2	....
1	....	....	1	....	....	.....	.....	1	.....	......	....
.....	....	....	....	....	....	.....	1	.....	.....	......	....
.....	....	....	....	....	1	.....	.....	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	....
.....	....	1	....	....	....	.....	.....	.....	.....	......	....
.....	....	....	....	....	....	.....	.....	.....	.....	......	....

Table III.— BIRTHS (exclusive of stillbirths) ***by color, general nativity of white mothers, born and the number living at the time of, and including the***

COUNTRY OF BIRTH OF MOTHER: NUMBER OF THE CHILD IN ORDER OF BIRTH, INCLUDING CHILD BORN IN 1920	Total children born in 1920	NUMBER OF CHILDREN					
		1	2	3	4	5	6
Total children born in 1920..	**102,604**	**32,674**	**23,442**	**16,572**	**10,996**	**7,237**	**4,825**
First child................	29,341	29,341	......	......	......	......	.....
Second child...............	21,761	2,643	19,116	......	......	......	.....
Third child................	15,930	474	3,240	12,214	......	......	.....
Fourth child...............	10,948	129	734	2,997	7,088	......	.....
Fifth child................	7,753	46	220	871	2,440	4,173	.....
Sixth child................	5,484	21	71	281	867	1,727	2,513
Seventh child..............	3,860	12	27	122	339	769	1,203
Eighth child...............	2,617	7	20	37	135	304	585
Ninth child................	1,745	1	8	24	70	139	276
Tenth child................	1,192	......	2	15	24	58	140
Eleventh child.............	712	......	1	6	14	30	55
Twelfth child..............	438	......	3	4	8	14	31
Thirteenth child...........	257	......	......	1	3	7	12
Fourteenth child...........	120	......	......	......	3	9	4
Fifteenth child............	59	......	......	......	2	3	3
Sixteenth child............	35	......	......	......	1	2	3
Seventeenth child..........	12	......	......	......	......	......	.....
Eighteenth child...........	3	......	......	......	......	......	.....
Nineteenth child...........	4	......	......	......	......	1	.....
Twentieth child............	3	......	......	......	......	......	.....
Twenty-first child.........	1	......	......	......	......	......	.....
Twenty-second child........	....	......	......	......	......	......	.....
Twenty-third child.........	....	......	......	......	......	......	.....
Twenty-fourth child........	....	......	......	......	......	......	.....
Twenty-fifth child.........	....	......	......	......	......	......	.....
Number of child not stated..	329	......	......	......	2	1	.....
Total children of white mothers born in U. S.....	**70,608**	**26,776**	**17,570**	**10,662**	**6,211**	**3,699**	**2,317**
First child................	24,289	24,289	......	......	......	......	.....
Second child...............	16,858	2,037	14,820	......	......	......	.....
Third child................	10,864	327	2,191	8,345	......	......	.....
Fourth child...............	6,534	77	414	1,711	4,332	......	.....
Fifth child................	4,116	26	101	405	1,259	2,324	.....
Sixth child................	2,759	7	21	125	414	856	1,336
Seventh child..............	1,812	8	9	46	127	320	564
Eighth child...............	1,163	5	5	14	39	110	232
Ninth child................	765	......	6	8	24	48	102
Tenth child................	498	......	......	4	7	17	42
Eleventh child.............	319	......	1	2	5	10	21
Twelfth child..............	190	......	2	2	3	6	9
Thirteenth child...........	108	......	......	......	......	1	6
Fourteenth child...........	56	......	......	......	......	3	2
Fifteenth child............	24	......	......	......	......	2	1
Sixteenth child............	12	......	......	......	......	1	2
Seventeenth child..........	4	......	......	......	......	......	.....
Eighteenth child...........	2	......	......	......	......	......	.....
Nineteenth child...........	2	......	......	......	......	......	.....
Twentieth child............	1	......	......	......	......	......	.....
Twenty-first child.........	1	......	......	......	......	......	.....
Twenty-second child........	....	......	......	......	......	......	.....
Twenty-third child.........	....	......	......	......	......	......	.....
Twenty-fourth child........	....	......	......	......	......	......	.....
Twenty-fifth child.........	....	......	......	......	......	......	.....
Number of child not stated..	231	......	......	......	1	1	.....

N.B.— In determining the number of child in order of birth, previous stillbirths in some

and the country of birth of foreign-born white mothers according to the number of children 1920 *birth, State of New York* (excluding New York City): 1920

LIVING, INCLUDING 1920 BIRTH

7	8	9	10	11	12	13	14	15	16	17	18	19	20	Not stated
2,995	1,709	922	565	283	99	36	16	9	3	..	..	..	..	340
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	2
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	2
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	3
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	4
1,388	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
774	754	....	....	....	....	....	....	..	..	..	..	..	..	1
403	431	393	....	....	....	....	....	..	..	..	..	..	..	.....
282	269	254	197	....	....	....	....	..	..	..	..	..	..	1
103	124	152	137	90	....	....	....	..	..	..	..	..	..	.....
51	71	71	94	50	40	....	....	..	..	..	..	..	..	1
28	33	37	43	48	31	19	....	..	..	..	..	..	..	.....
8	7	10	19	24	14	12	10	..	..	..	..	..	..	.....
9	5	2	9	8	6	3	4	5	..	..	..	..	..	.....
2	4	2	3	8	6	1	1	1	1	..	..	..	..	.....
2	1	....	2	2	2	....	1	2	..	..	..	..	..	.....
.....	....	....	....	1	....	....	....	1	1	..	..	..	..	.....
.....	1	....	....	....	....	1	....	..	1	..	..	..	..	.....
.....	....	1	1	1	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	1	....	....	....	..	..	..	..	..	..	.....
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.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	326
1,443	792	442	254	107	61	22	12	5	2	..	..	..	..	233
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	1
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	1
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	1
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
738	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
378	380	....	....	....	....	....	....	..	..	..	..	..	..	.....
159	209	209	....	....	....	....	....	..	..	..	..	..	..	.....
94	113	122	99	....	....	....	....	..	..	..	..	..	..	.....
40	47	65	79	49	....	....	....	..	..	..	..	..	..	.....
18	23	27	51	20	28	....	....	..	..	..	..	..	..	1
11	11	13	14	18	22	12	....	..	..	..	..	..	..	.....
.....	4	4	6	14	6	9	8	..	..	..	..	..	..	.....
3	2	2	3	3	2	....	3	3	..	..	..	..	..	.....
.....	1	....	1	2	3	....	1	..	1	..	..	..	..	.....
2	1	....	....	....	....	....	....	1	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	1	1	..	..	..	..	.....
.....	1	....	....	....	....	1	....	..	..	..	..	..	..	.....
.....	....	....	1	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	1	....	....	....	..	..	..	..	..	..	.....
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.....	....	....	....	....	....	....	....	..	..	..	..	..	..	229

cases may have been included.

Table III.— BIRTHS (exclusive of stillbirths) *by color, general nativity of white mothers, born and the number living at the time of, and including the 1920 birth,*

COUNTRY OF BIRTH OF MOTHER: NUMBER OF THE CHILD IN ORDER OF BIRTH, INCLUDING CHILD BORN IN 1920	Total children born in 1920	NUMBER OF CHILDREN 1	2	3	4	5	6
Children born to foreign white mothers	**31,154**	**5,605**	**5,686**	**5,774**	**4,699**	**3,485**	**2,471**
First child	4,803	4,803	......	......	......	......	.....
Second child	4,736	576	4,159	......	......	......	.....
Third child	4,932	138	1,013	3,780	......	......	.....
Fourth child	4,327	50	314	1,255	2,708	......	.....
Fifth child	3,576	18	115	458	1,159	1,824	.....
Sixth child	2,674	13	48	153	446	856	1,154
Seventh child	2,018	4	18	75	209	440	634
Eighth child	1,438	2	15	21	93	194	348
Ninth child	966	1	2	14	44	90	172
Tenth child	688	......	1	11	17	39	97
Eleventh child	384	......	......	4	9	20	34
Twelfth child	242	......	1	2	5	8	21
Thirteenth child	147	......	......	1	8	6	6
Fourteenth child	68	......	......	......	8	6	2
Fifteenth child	34	......	......	......	1	1	2
Sixteenth child	22	......	......	......	1	1	1
Seventeenth child	8	......	......	......	......	......	.....
Eighteenth child	1	......	......	......	......	......	.....
Nineteenth child	1	......	......	......	......	......	.....
Twentieth child	2	......	......	......	......	......	.....
Twenty-first child	....	......	......	......	......	......	.....
Twenty-second child	....	......	......	......	......	......	.....
Twenty-third child	....	......	......	......	......	......	.....
Twenty-fourth child	....	......	......	......	......	......	.....
Twenty-fifth child	....	......	......	......	......	......	.....
Number of child not stated	97	......	......	......	1	......	.....
Children born to white mothers, country of birth not stated Total	3	1	......	1	......	......	.....
First child	1	1	......	......	......	......	.....
Second child	....	......	......	......	......	......	.....
Third child	1	......	......	1	......	......	.....
Fourth child	....	......	......	......	......	......	.....
Fifth child	....	......	......	......	......	......	.....
Sixth child	....	......	......	......	......	......	.....
Seventh child	....	......	......	......	......	......	.....
Eighth child	....	......	......	......	......	......	.....
Ninth child	....	......	......	......	......	......	.....
Tenth child	....	......	......	......	......	......	.....
Eleventh child	....	......	......	......	......	......	.....
Twelfth child	....	......	......	......	......	......	.....
Thirteenth child	....	......	......	......	......	......	.....
Fourteenth child	....	......	......	......	......	......	.....
Fifteenth child	....	......	......	......	......	......	.....
Sixteenth child	....	......	......	......	......	......	.....
Seventeenth child	....	......	......	......	......	......	.....
Eighteenth child	....	......	......	......	......	......	.....
Nineteenth child	....	......	......	......	......	......	.....
Twentieth child	....	......	......	......	......	......	.....
Twenty-first child	....	......	......	......	......	......	.....
Twenty-second child	....	......	......	......	......	......	.....
Twenty-third child	....	......	......	......	......	......	.....
Twenty-fourth child	....	......	......	......	......	......	.....
Twenty-fifth child	....	......	......	......	......	......	.....
Number of child not stated	1	......	......	......	......	......	.....

and the country of birth of foreign-born white mothers according to the number of children
State of New York (excluding New York City): 1920 — (Continued)

LIVING, INCLUDING 1920 BIRTH

7	8	9	10	11	12	13	14	15	16	17	18	19	20	Not stated
1,527	596	474	249	122	38	13	4	4	1	..	..	..	..	106
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	1
....	....	....	....	....	....	....	....	..	..	..	..	..	..	1
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	2
....	....	....	....	....	....	....	....	..	..	..	..	..	..	4
638	....	....	....	....	....	....	....	..	..	..	..	..	..	....
393	371	....	....	....	....	....	....	..	..	..	..	..	..	1
241	221	181	....	....	....	....	....	..	..	..	..	..	..	....
137	151	132	97	....	....	....	....	..	..	..	..	..	..	1
59	76	85	58	39	....	....	....	..	..	..	..	..	..	....
32	46	43	43	29	12	....	....	..	..	..	..	..	..	....
12	22	24	29	29	9	6	....	..	..	..	..	..	..	....
8	3	6	12	10	8	3	2	..	..	..	..	..	..	....
6	3	....	6	5	4	3	1	2	..	..	..	..	..	....
1	3	2	2	6	3	1	....	1	..	..	..	..	..	....
....	....	....	2	2	2	....	1	1	..	..	..	..	..	....
....	....	....	....	1	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	1	..	..	..	..	....
....	....	1	....	1	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
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....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	96
....	....	....	....	....	....	....	....	..	..	..	..	..	..	1
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
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....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
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....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	1

Table III.— BIRTHS (exclusive of stillbirths) *by color, general nativity of white mothers, born and the number living at the time of, and including the 1920 birth,*

COUNTRY OF BIRTH OF MOTHER: NUMBER OF THE CHILD IN ORDER OF BIRTH, INCLUDING CHILD BORN IN 1920	Total children born in 1920	NUMBER OF CHILDREN					
		1	2	3	4	5	6
Children of mothers born in England, Scotland and Wales							
Total	**1,534**	**518**	**383**	**251**	**152**	**78**	**61**
First child	475	475	....	....	....	....	....
Second child	361	36	325	....	....	....	....
Third child	243	6	45	192	....	....	....
Fourth child	163	....	9	44	110	....	....
Fifth child	88	1	3	12	26	46	....
Sixth child	75	....	1	2	13	23	36
Seventh child	35	....	....	1	3	6	13
Eighth child	30	....	....	....	....	2	5
Ninth child	21	....	....	....	....	1	4
Tenth child	17	....	....	....	....	....	2
Eleventh child	6	....	....	....	....	....	1
Twelfth child	6	....	....	....	....	....	....
Thirteenth child	4	....	....	....	....	....	....
Fourteenth child	4	....	....	....	....	....	....
Fifteenth child	1	....	....	....	....	....	....
Sixteenth child	....	....	....	....	....	....	....
Seventeenth child	....	....	....	....	....	....	....
Eighteenth child	....	....	....	....	....	....	....
Nineteenth child	....	....	....	....	....	....	....
Twentieth child	....	....	....	....	....	....	....
Twenty-first child	....	....	....	....	....	....	....
Twenty-second child	....	....	....	....	....	....	....
Twenty-third child	....	....	....	....	....	....	....
Twenty-fourth child	....	....	....	....	....	....	....
Twenty-fifth child	....	....	....	....	....	....	....
Number of child not stated	5	....	....	....	....	....	....
Children of mothers born in Ireland							
Total	**1,489**	**359**	**330**	**268**	**221**	**129**	**89**
First child	319	319	....	....	....	....	....
Second child	306	33	273	....	....	....	....
Third child	238	4	41	193	....	....	....
Fourth child	232	3	11	55	163	....	....
Fifth child	133	....	3	14	40	76	....
Sixth child	101	....	1	3	14	29	54
Seventh child	59	....	1	3	3	14	16
Eighth child	44	....	....	....	....	9	13
Ninth child	21	....	....	....	1	....	4
Tenth child	16	....	....	....	....	1	2
Eleventh child	7	....	....	....	....	....	....
Twelfth child	3	....	....	....	....	....	....
Thirteenth child	3	....	....	....	....	....	....
Fourteenth child	....	....	....	....	....	....	....
Fifteenth child	....	....	....	....	....	....	....
Sixteenth child	1	....	....	....	....	....	....
Seventeenth child	1	....	....	....	....	....	....
Eighteenth child	....	....	....	....	....	....	....
Nineteenth child	....	....	....	....	....	....	....
Twentieth child	....	....	....	....	....	....	....
Twenty-first child	....	....	....	....	....	....	....
Twenty-second child	....	....	....	....	....	....	....
Twenty-third child	....	....	....	....	....	....	....
Twenty-fourth child	....	....	....	....	....	....	....
Twenty-fifth child	....	....	....	....	....	....	....
Number of child not stated	5	....	....	....	....	....	....

and the country of birth of foreign-born white mothers according to the number of children
State of New York (excluding New York City): 1920 — (Continued)

LIVING, INCLUDING 1920 BIRTH

7	8	9	10	11	12	13	14	15	16	17	18	19	20	Not stated
32	25	12	10	7	....	....	....	..	..	..	..	..	..	5
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
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....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
12	....	....	....	....	....	....	....	..	..	..	..	..	..	....
11	12	....	....	....	....	....	....	..	..	..	..	..	..	....
5	8	8	....	....	....	....	....	..	..	..	..	..	..	....
1	4	5	5	....	....	....	....	..	..	..	..	..	..	....
....	....	2	1	2	....	....	....	..	..	..	..	..	..	....
2	1	1	1	1	....	....	....	..	..	..	..	..	..	....
1	....	1	1	1	....	....	....	..	..	..	..	..	..	....
....	....	....	2	2	....	....	....	..	..	..	..	..	..	....
....	....	....	....	1	....	....	....	..	..	..	..	..	..	....
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....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	5
40	23	13	7	4	1	....	....	..	..	..	..	..	..	5
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
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22	....	....	....	....	....	....	....	..	..	..	..	..	..	....
9	13	....	....	....	....	....	....	..	..	..	..	..	..	....
7	4	5	....	....	....	....	....	..	..	..	..	..	..	....
1	5	2	5	....	....	....	....	..	..	..	..	..	..	....
1	....	5	1	....	....	....	....	..	..	..	..	..	..	....
....	1	....	1	1	....	....	....	..	..	..	..	..	..	....
....	....	1	....	2	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	1	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	1	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
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....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	5

Table III.— BIRTHS (exclusive of stillbirths) *by color, general nativity of white mothers, born and the number living at the time of, and including the 1920 birth,*

COUNTRY OF BIRTH OF MOTHER: NUMBER OF THE CHILD IN ORDER OF BIRTH, INCLUDING CHILD BORN IN 1920	Total children born in 1920	NUMBER OF CHILDREN					
		1	2	3	4	5	6
Children of German mothers, except German-Polish Total	**1,201**	**216**	**216**	**218**	**142**	**119**	**107**
First child	189	189	......	......	......	......	......
Second child	191	21	170	......	......	......	......
Third child	200	3	34	163	......	......	......
Fourth child	131	2	7	33	89	......	......
Fifth child	116	......	4	14	29	69	......
Sixth child	91	......	1	4	9	22	55
Seventh child	66	1	......	3	4	14	22
Eighth child	62	......	......	......	6	6	15
Ninth child	44	......	......	1	2	3	8
Tenth child	42	......	......	......	1	2	5
Eleventh child	20	......	......	......	1	1	......
Twelfth child	20	......	......	......	......	1	1
Thirteenth child	16	......	......	......	1	......	1
Fourteenth child	5	......	......	......	......	1	......
Fifteenth child	2	......	......	......	......	......	......
Sixteenth child	1	......	......	......	......	......	......
Seventeenth child	1	......	......	......	......	......	......
Eighteenth child	......	......	......	......	......	......	......
Nineteenth child	......	......	......	......	......	......	......
Twentieth child	......	......	......	......	......	......	......
Twenty-first child	......	......	......	......	......	......	......
Twenty-second child	......	......	......	......	......	......	......
Twenty-third child	......	......	......	......	......	......	......
Twenty-fourth child	......	......	......	......	......	......	......
Twenty-fifth child	......	......	......	......	......	......	......
Number of child not stated	4	......	......	......	......	......	......
Children of mothers born in Italy Total	**10,926**	**1,739**	**1,492**	**1,800**	**1,689**	**1,454**	**1,127**
First child	1,478	1,478	......	......	......	......	......
Second child	1,182	167	1,014	......	......	......	......
Third child	1,425	52	302	1,070	......	......	......
Fourth child	1,472	21	98	432	921	......	......
Fifth child	1,396	10	39	180	436	729	......
Sixth child	1,142	7	19	66	180	359	508
Seventh child	924	2	10	30	82	203	293
Eighth child	641	1	7	11	33	86	158
Ninth child	461	1	1	5	21	38	81
Tenth child	342	......	1	3	9	15	50
Eleventh child	200	......	......	1	3	12	19
Twelfth child	109	......	1	1	1	4	11
Thirteenth child	61	......	......	1	1	3	3
Fourteenth child	29	......	......	......	......	3	2
Fifteenth child	18	......	......	......	1	1	1
Sixteenth child	10	......	......	......	......	1	1
Seventeenth child	4	......	......	......	......	......	......
Eighteenth child	1	......	......	......	......	......	......
Nineteenth child	1	......	......	......	......	......	......
Twentieth child	2	......	......	......	......	......	......
Twenty-first child	......	......	......	......	......	......	......
Twenty-second child	......	......	......	......	......	......	......
Twenty-third child	......	......	......	......	......	......	......
Twenty-fourth child	......	......	......	......	......	......	......
Twenty-fifth child	......	......	......	......	......	......	......
Number of child not stated	28	......	......	......	1	......	......

and the country of birth of foreign-born white mothers according to the number of children
State of New York (excluding New York City): 1920 — (Continued)

LIVING, INCLUDING 1920 BIRTH

7	8	9	10	11	12	13	14	15	16	17	18	19	20	Not stated
61	42	27	27	11	7	2	1	1	..	..	..	..	..	4
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
22	....	....	....	....	....	....	....	..	..	..	..	..	..	....
20	15	....	....	....	....	....	....	..	..	..	..	..	..	....
12	11	7	....	....	....	....	....	..	..	..	..	..	..	....
7	10	8	9	....	....	....	....	..	..	..	..	..	..	....
....	3	4	7	4	....	....	....	..	..	..	..	..	..	....
....	2	6	4	3	3	....	....	..	..	..	..	..	..	....
....	1	2	5	2	2	2	....	..	..	..	..	..	..	....
....	....	....	2	1	1	....	....	..	..	..	..	..	..	....
....	....	....	....	1	1	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	1	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	1	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	4
732	423	232	112	58	14	4	2	1	1	..	..	..	..	36
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	1
....	....	....	....	....	....	....	....	..	..	..	..	..	..	1
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	2
....	....	....	....	....	....	....	....	..	..	..	..	..	..	3
304	....	....	....	....	....	....	....	..	..	..	..	..	..	....
176	168	....	....	....	....	....	....	..	..	..	..	..	..	1
118	106	90	....	....	....	....	....	..	..	..	..	..	..	....
73	78	63	49	....	....	....	....	..	..	..	..	..	..	1
32	45	47	26	15	....	....	....	..	..	..	..	..	..	....
12	21	21	19	14	4	....	....	..	..	..	..	..	..	....
8	11	7	9	14	3	1	....	..	..	..	..	..	..	....
4	2	3	4	5	4	1	1	..	..	..	..	..	..	....
4	1	....	3	2	2	2	....	1	..	..	..	..	..	....
1	1	....	1	4	1	....	....	..	..	..	..	..	..	....
....	....	....	1	2	....	....	1	..	..	..	..	..	..	....
....	....	....	....	1	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	1	..	..	..	..	....
....	....	1	....	1	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	....
....	....	....	....	....	....	....	....	..	..	..	..	..	..	27

Table III.— BIRTHS (exclusive of stillbirths) *by color, general nativity of white mothers,* *born and the number living at the time of, and including the* 1920 *birth,*

COUNTRY OF BIRTH OF MOTHER: NUMBER OF THE CHILD IN ORDER OF BIRTH, INCLUDING CHILD BORN IN 1920	Total children born in 1920	NUMBER OF CHILDREN					
		1	2	3	4	5	6
Children of Russian mothers, except Russian-Polish Total	**2,522**	**446**	**545**	**548**	**418**	**236**	**157**
First child	395	395	......	......	......	......	.....
Second child	463	40	423	......	......	......	.....
Third child	484	6	74	404	......	......	.....
Fourth child	400	1	28	99	272	......	.....
Fifth child	262	3	13	25	95	126	.....
Sixth child	188	1	6	10	28	68	75
Seventh child	110	......	......	6	12	18	41
Eighth child	83	......	1	1	7	6	23
Ninth child	56	......	......	......	2	8	9
Tenth child	35	......	......	2	......	2	8
Eleventh child	20	......	......	......	2	1	.....
Twelfth child	12	......	......	1	......	......	.....
Thirteenth child	8	......	......	......	......	1	.....
Fourteenth child	....	......	......	......	......	......	.....
Fifteenth child	2	......	......	......	......	......	1
Sixteenth child	....	......	......	......	......	......	.....
Seventeenth child	....	......	......	......	......	......	.....
Eighteenth child	....	......	......	......	......	......	.....
Nineteenth child	....	......	......	......	......	......	.....
Twentieth child	....	......	......	......	......	......	.....
Twenty-first child	....	......	......	......	......	......	.....
Twenty-second child	....	......	......	......	......	......	.....
Twenty-third child	....	......	......	......	......	......	.....
Twenty-fourth child	....	......	......	......	......	......	.....
Twenty-fifth child	....	......	......	......	......	......	.....
Number of child not stated	4	......	......	......	......	......	.....
Children of Austrian mothers, except Austrian-Polish Total	**2,752**	**367**	**589**	**532**	**477**	**311**	**204**
First child	286	286	......	......	......	......	.....
Second child	483	58	425	......	......	......	.....
Third child	468	15	104	349	......	......	.....
Fourth child	419	4	45	113	257	......	.....
Fifth child	357	1	9	52	129	166	.....
Sixth child	230	3	8	10	42	80	92
Seventh child	178	......	......	5	24	43	61
Eighth child	141	......	2	3	14	14	32
Ninth child	72	......	1	......	8	5	9
Tenth child	45	......	......	......	1	1	4
Eleventh child	27	......	......	......	......	1	3
Twelfth child	21	......	......	......	2	......	3
Thirteenth child	11	......	......	......	......	1	.....
Fourteenth child	2	......	......	......	......	......	.....
Fifteenth child	2	......	......	......	......	......	.....
Sixteenth child	....	......	......	......	......	......	.....
Seventeenth child	1	......	......	......	......	......	.....
Eighteenth child	....	......	......	......	......	......	.....
Nineteenth child	....	......	......	......	......	......	.....
Twentieth child	....	......	......	......	......	......	.....
Twenty-first child	....	......	......	......	......	......	.....
Twenty-second child	....	......	......	......	......	......	.....
Twenty-third child	....	......	......	......	......	......	.....
Twenty-fourth child	....	......	......	......	......	......	.....
Twenty-fifth child	....	......	......	......	......	......	.....
Number of child not stated	9	......	......	......	......	......	.....

and the country of birth of foreign-born white mothers according to the number of children
State of New York (excluding New York City): 1920 — (Concluded)

LIVING, INCLUDING 1920 BIRTH

7	8	9	10	11	12	13	14	15	16	17	18	19	20	Not stated
23	**12**	**5**	**2**	**4**	....	**1**	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
10	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
3	3	....	....	....	....	....	....	..	..	..	..	..	..	.....
3	1	2	....	....	....	....	....	..	..	..	..	..	..	.....
1	5	....	1	....	....	....	....	..	..	..	..	..	..	.....
4	1	2	....	2	....	....	....	..	..	..	..	..	..	.....
1	2	1	....	1	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	1	....	1	....	..	..	..	..	..	..	.....
.....	....	....	1	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
1	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
2	....	**1**	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	15	..	..	..	..	..	Not stated
2	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	1	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....
.....	....	....	....	....	....	....	....	..	..	..	..	..	..	.....

Table IV.— NEW YORK STATE (exclusive of New York City): *Births* (exclusive of *father*:

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	Total	AGE					
		16	17	18	19	20	21
Children born to native white mothers—total males	**26,443**	**4**	**18**	**68**	**216**	**482**	**927**
Under 15 years	14	1	....	1	2	....	2
15 years	45	....	2	1	3	6	5
16 years	148	1	4	5	18	14	16
17 years	442	1	4	12	25	36	59
18 years	910	1	1	25	48	94	102
19 years	1,390	....	3	10	51	97	168
20 years	1,826	....	2	6	35	95	187
21 years	1,936	....	....	2	12	59	176
22 years	2,210	....	2	4	6	28	86
23 years	2,330	....	....	2	5	22	58
24 years	2,387	....	....	....	6	9	22
25 years	2,402	....	....	....	1	9	15
26 years	2,331	....	....	....	3	5	7
27 years	2,088	....	....	....	....	4	10
28 years	2,063	....	....	....	1	1	7
29 years	1,736	....	....	....	....	1	1
30 years	1,770	....	....	....	....	1	2
31 years	1,480	....	....	....	....	1	1
32 years	1,425	....	....	....	....	....	1
33 years	1,196	....	....	....	....	....	.....
34 years	1,172	....	....	....	....	....	.....
35 years	917	....	....	....	....	....	.....
36 years	832	....	....	....	....	....	.....
37 years	754	....	....	....	....	....	1
38 years	681	....	....	....	....	....	.....
39 years	534	....	....	....	....	....	.....
40 years	443	....	....	....	....	....	.....
41 years	304	....	....	....	....	....	.....
42 years	258	....	....	....	....	....	.....
43 years	143	....	....	....	....	....	.....
44 years	114	....	....	....	....	....	.....
45–49 years	122	....	....	....	....	....	.....
50 years and over	3	....	....	....	....	....	.....
Age not stated	37	....	....	....	....	....	1

stillbirths) *by sex and by the color, nativity and age of mother according to age of* **1920**

OF FATHER									
22	23	24	25	26	27	28	29	30	31
1,279	**1,626**	**1,912**	**2,021**	**2,296**	**2,195**	**2,236**	**2,100**	**1,983**	**1,742**
....	......	2	1	......	......	......	......	......	....
3	......	2	1	2	2	1	3	......	....
9	7	17	8	6	5	2	3	3	4
51	51	34	26	32	22	14	12	5	2
122	105	98	70	45	32	28	21	16	9
188	154	148	105	94	75	71	40	30	13
200	233	213	191	138	116	75	61	57	27
195	240	214	190	192	136	129	83	67	49
227	260	284	211	231	204	142	113	65	67
114	258	258	301	279	207	184	131	124	66
69	129	277	272	306	268	233	175	150	86
32	83	152	265	303	285	237	205	186	137
18	39	80	161	284	284	271	213	178	170
16	24	43	77	155	249	225	252	187	178
11	13	40	56	96	118	266	248	225	178
8	13	9	34	51	67	140	226	207	161
8	3	16	24	34	42	92	121	218	199
2	7	4	9	19	21	52	74	104	168
2	1	5	7	14	20	32	40	55	102
....	1	2	4	4	8	16	28	40	42
1	......	3	2	5	9	9	18	19	34
....	1	1	2	1	6	4	10	18	22
....	......	1	......	3	6	3	7	11	9
....	......	......	......	......	6	5	7	6	7
....	1	......	1	......	1	2	3	5	5
....	......	......	1	1	2	......	1	3	2
....	......	......	1	1	......	......	2	......	3
....	......	......	......	......	1	......	......	1	1
....	......	......	......	......	......	......	......	1	....
....	......	......	......	......	1	......	2	......	1
....	......	......	......	......	......	......	......	......	....
....	......	......	......	......	......	......	......	......	....
....	......	......	......	......	......	......	......	......	....
3	3	......	1	......	2	3	1	2	....

Table IV. — NEW YORK STATE (exclusive of New York City): *Births* (exclusive of
1920 —

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	Age					
	32	33	34	35	36	37
Children born to native white mothers — total males	**1,766**	**1,545**	**1,432**	**1,279**	**1,197**	**1,025**
Under 15 years	......	1	1	......	......	......
15 years	......	......	1	......	......	......
16 years	1	2	......	2	1	......
17 years	2	5	4	1	1	2
18 years	11	10	1	4	1	1
19 years	26	21	11	8	3	5
20 years	23	28	18	18	13	3
21 years	34	24	25	10	12	9
22 years	70	42	24	24	22	17
23 years	69	67	31	34	16	15
24 years	78	59	56	35	34	18
25 years	120	65	75	54	37	29
26 years	138	86	71	61	69	37
27 years	143	109	80	71	48	61
28 years	155	142	100	83	74	35
29 years	158	135	96	80	57	45
30 years	174	145	123	108	92	61
31 years	165	150	124	107	87	87
32 years	191	147	152	101	98	83
33 years	89	135	135	117	86	98
34 years	53	95	140	124	119	93
35 years	18	30	71	102	99	81
36 years	21	17	25	50	95	88
37 years	9	11	26	36	51	65
38 years	5	12	18	16	37	50
39 years	5	3	10	15	22	23
40 years	2	2	7	11	13	10
41 years	......	......	1	2	3	4
42 years	3	......	3	1	5	5
43 years	......	1	1	1	1	1
44 years	......	......	1	1	1	......
45–49 years	2	......	......	1	......	1
50 years and over	......	......	......	......	......	......
Age not stated	1	1	1	1	......	......

stillbirths) ***by sex and by the color, nativity and age of mother according to age of father:*** **(Continued)**

of Father

38	39	40	41	42	43	44	45–49	50 and over	Age not stated
1,054	**860**	**839**	**530**	**614**	**481**	**365**	**1,350**	**617**	**384**
....	......	......	......	......	......	......	......	......	3
....	......	......	......	......	......	......	1	1	11
1	......	......	......	......	......	......	2	......	17
1	1	......	1	......	......	......	......	......	38
2	1	......	......	......	4	......	2	......	56
6	4	3	3	......	1	......	5	3	44
13	5	2	2	6	......	1	7	5	46
6	5	6	2	1	2	2	8	7	39
14	10	5	4	8	3	2	9	5	21
14	9	5	7	8	6	2	17	6	15
24	17	12	3	5	4	5	15	10	10
20	16	14	6	7	8	8	14	11	8
30	21	14	14	18	7	5	21	11	6
37	22	19	6	14	9	7	23	9	10
53	36	29	12	14	16	5	29	14	6
52	47	37	16	20	11	10	33	12	9
58	51	45	19	21	24	13	52	23	1
60	43	42	37	22	13	11	46	16	8
71	47	44	33	45	21	21	63	25	4
73	58	52	31	34	40	24	49	24	6
93	71	65	45	29	38	26	61	19	1
93	80	62	32	40	33	15	66	26	4
90	71	78	34	45	27	21	90	36	6
86	82	68	44	50	31	27	94	41	1
75	59	76	42	48	43	30	100	49	3
39	50	72	47	40	35	30	93	40	....
26	26	52	35	43	37	28	90	54	....
7	14	21	32	52	21	24	79	41	....
7	9	9	12	24	25	23	94	36	1
1	2	3	8	9	17	9	55	30	....
....	......	......	......	6	3	6	76	20	....
2	2	3	2	4	2	10	53	40	....
....	......	......	......	......	......	......	1	2	....
....	1	1	1	1	......	......	2	1	10

Table IV.— NEW YORK STATE (exclusive of New York City): *Births* (exclusive of 1920 —

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	Total	AGE 16	17	18	19	20	21
Children born to native white mothers— total females	**34,165**	**5**	**17**	**82**	**241**	**488**	**884**
Under 15 years	14	2	1	1	2	....	2
15 years	35	1	....	4	1	1	3
16 years	155	1	4	9	9	12	16
17 years	447	....	8	17	33	49	51
18 years	898	1	2	21	53	90	122
19 years	1,366	....	2	14	70	98	137
20 years	1,696	....	....	6	26	103	177
21 years	1,860	....	....	4	14	59	156
22 years	2,118	....	....	5	17	27	99
23 years	2,206	....	....	1	5	19	43
24 years	2,147	....	....	....	3	14	37
25 years	2,195	....	....	....	3	6	12
26 years	2,292	....	....	....	1	3	13
27 years	1,990	....	....	....	1	1	3
28 years	1,811	....	....	....	1	3	6
29 years	1,709	....	....	....	1	3	2
30 years	1,585	....	....	....	....	....	1
31 years	1,296	....	....	....	....	....	3
32 years	1,389	....	....	....	....	....	1
33 years	1,111	....	....	....	....	....	.....
34 years	1,062	....	....	....	1	....	.....
35 years	928	....	....	....	....	....	.....
36 years	843	....	....	....	....	....	.....
37 years	689	....	....	....	....	....	.....
38 years	671	....	....	....	....	....	.....
39 years	489	....	....	....	....	....	.....
40 years	462	....	....	....	....	....	.....
41 years	272	....	..	....	....	....	.....
42 years	247	....	....	....	....	....	.....
43 years	138		..	....	....	....	.....
44 years	79	....	....	....	....	....	.....
45–49 years	92	....	....	....	....	....	.....
50 years and over	1	....	....	....	....	....	.....
Age not stated	32	....	....	....	....	....	.....

stillbirths) *by sex and by the color, nativity and age of mother according to age of father:* (Continued)

OF FATHER

22	23	24	25	26	27	28	29	30	31
1,232	1,634	1,797	1,942	2,052	2,073	2,116	1,963	1,865	1,626
1	......	......	......	1	......	......	......	......	1
3	3	1	1	......	4	1	......	2	......
21	11	15	7	3	7	3	2	1	4
46	54	43	30	21	19	16	3	4	2
127	101	90	64	52	83	26	15	15	7
176	165	146	115	88	70	70	44	27	28
200	243	190	144	132	111	82	46	63	21
186	260	211	201	163	127	98	87	59	55
204	245	253	244	218	184	142	91	76	61
109	220	289	270	237	221	169	142	90	71
64	131	229	247	278	208	211	151	143	92
30	80	136	265	276	258	228	192	149	117
28	50	75	149	262	275	263	238	207	154
13	31	45	80	136	245	262	233	186	136
9	12	25	51	80	120	231	212	200	155
7	6	16	25	45	89	122	237	192	176
3	3	10	15	19	41	86	114	190	165
1	9	7	14	14	16	41	61	91	152
1	6	6	5	10	19	24	40	60	89
....	......	4	4	4	10	16	20	31	60
1	2	2	4	5	4	6	15	28	26
....	......	2	3	1	5	8	6	19	24
1	1	......	2	2	2	1	6	9	17
....	......	......	1	2	2	3	5	9	6
....	......	1	......	2	2	5	1	6	4
....	......	......	......	......	1	......	1	3	1
....	......	......	1	......	......	......	......	2	......
....	......	......	......	......	......	1	......	......	2
....	1	......	......	......	......	......	......	......	......
....	......	......	......	......	......	......	......	1	......
....	......	......	......	......	......	......	......	......	......
....	......	......	......	......	......	......	......	......	......
....	......	......	......	......	......	......	......	......	......
1	......	1	......	1	......	1	1	2	2

Table IV.— NEW YORK STATE (exclusive of New York City): *Births* (exclusive of
1920 —

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	AGE					
	32	33	34	35	36	37
Children born to colored mothers — total males	**19**	**7**	**12**	**21**	**20**	**9**
Under 15 years	......	......	......	......	......	......
15 years	......	......	......	......	......	......
16 years	......	......	......	......	......	......
17 years	......	......	......	......	......	......
18 years	......	......	......	......	1	......
19 years	1	......	......	......	......	......
20 years	......	......	1	2	1	......
21 years	1	......	1	......	......	......
22 years	......	......	1	......	......	......
23 years	1	......	......	......	1	......
24 years	......	......	1	......	2	......
25 years	2	1	......	2	1	......
26 years	5	......	......	1	3	......
27 years	1	1	1	2	1	......
28 years	1	1	......	2	......	......
29 years	1	......	......	......	1	1
30 years	1	3	3	3	1	......
31 years	1	1	......	......	......	......
32 years	1	......	1	3	......	......
33 years	2	......	2	2	1	1
34 years	......	......	1	2	3	......
35 years	1	......	......	1	......	1
36 years	......	......	......	......	1	2
37 years	......	......	......	......	1	2
38 years	......	......	......	......	1	......
39 years	......	......	......	......	......	2
40 years	......	......	......	......	......	......
41 years	......	......	......	......	......	......
42 years	......	......	......	1	......	......
43 years	......	......	......	......	1	......
44 years	......	......	......	......	......	......
45–49 years	......	......	......	......	......	......
50 years and over	......	......	......	......	......	......
Age not stated	......	......	......	......	......	......

stillbirths) ***by sex and by the color, nativity and age of mother according to age of father:*** **(Continued)**

OF FATHER

38	39	40	41	42	43	44	45–49	50 and over	Age not stated
939	**836**	**722**	**534**	**573**	**457**	**351**	**1,176**	**585**	**358**
......	......	......	......	......	......	......	......	......	3
......	......	1	......	......	......	......	......	......	7
2	......	......	......	......	......	......	......	......	23
1	......	......	1	......	......	......	......	......	39
3	3	......	......	4	......	......	2	1	44
5	2	2	1	3	4	1	4	......	38
1	7	5	1	3	......	......	3	7	44
8	2	3	1	2	5	2	8	3	31
11	9	7	10	5	1	5	5	4	20
18	17	7	5	5	5	4	10	5	13
13	14	15	7	5	7	5	11	9	11
21	16	14	16	4	4	3	11	11	8
27	21	21	8	4	4	5	15	7	13
36	25	20	13	7	7	7	23	13	9
54	34	23	11	10	8	4	19	17	7
32	51	28	12	23	12	6	32	16	5
55	47	44	20	25	16	8	35	17	3
52	49	35	31	26	13	8	42	13	4
75	46	46	33	38	19	11	50	29	3
68	45	33	30	36	48	24	41	11	4
83	65	43	35	41	31	25	54	22	......
87	81	61	44	45	20	16	65	22	6
75	68	81	50	43	22	35	86	37	2
68	62	44	49	26	31	28	90	37	5
72	66	58	43	52	50	30	109	43	2
27	57	54	42	39	36	33	88	45	2
19	23	49	30	47	35	30	82	52	......
8	9	15	27	36	32	15	75	31	1
7	9	10	8	27	23	22	82	48	......
5	3	1	2	9	17	10	63	24	......
2	2	1	3	6	4	9	25	26	1
3	1	......	1	1	3	5	45	33	......
......	......	......	......	......	......	......	......	1	......
1	2	1	......	1	......	......	1	1	10

Table IV.— NEW YORK STATE (exclusive of New York City): *Births* (exclusive of
1920—

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	Total	AGE					
		16	17	18	19	20	21
Children born to foreign-born white mothers — total males	**15,969**	....	**1**	**7**	**17**	**43**	**82**
Under 15 years	2	....	....	....	....	....	.....
15 years	3	....	....	....	....	....	.....
16 years	32	....	....	1	....	2	4
17 years	87	....	....	1	3	4	5
18 years	173	....	1	1	4	6	7
19 years	298	....	....	1	3	10	13
20 years	365	....	....	....	2	7	16
21 years	477	....	....	....	1	7	14
22 years	570	....	....	2	2	2	9
23 years	748	....	....	....	....	2	7
24 years	887	....	....	....	1	1	2
25 years	960	....	....	....	..	....	1
26 years	930	....	....	....	....	....	2
27 years	912	....	....	....	1	1	1
28 years	1,020	....	....	1	....	....	.....
29 years	869	....	....	....	....	...	.....
30 years	955	....	....	....	....	1	.....
31 years	692	....	....	....	....	....	.....
32 years	830	....	....	....	....	....	.....
33 years	737	....	....	....	....	....	.....
34 years	618	....	....	....	....	....	.....
35 years	628	....	....	....	....	....	.....
36 years	632	....	....	....	....	....	.....
37 years	514	....	....	....	....	....	.....
38 years	553	....	....	....	....	....	.....
39 years	386	....	....	....	....	....	.....
40 years	367	....	....	....	....	....	.....
41 years	187	....	....	....	....	....	.....
42 years	200	....	....	....	....	....	.....
43 years	124	....	....	....	....	....	.....
44 years	84	....	....	....	....	....	.....
45–49 years	111	....	....	....	....	....	.....
50 years and over	5	....	....	....	....	....	.....
Age not stated	13	....	....	....	....	....	1

stillbirths) *by sex and by the color, nativity and age of mother according to age of father:* **(Continued)**

OF FATHER

22	23	24	25	26	27	28	29	30	31
167	273	428	511	627	719	854	794	965	725
....	1	1	......	......	......	......	......	......	....
....	......	1	......	2	......	......	......	......	....
5	3	3	1	2	3	1	......	......	1
4	8	15	6	10	8	5	6	2	3
28	19	22	20	17	17	10	3	1	2
23	26	41	31	34	40	28	11	8	7
12	33	40	47	37	32	37	24	34	9
39	51	54	45	50	41	44	21	25	24
18	45	46	48	61	70	46	55	38	22
11	44	59	75	79	71	95	49	63	33
14	17	60	81	72	91	86	84	91	49
4	11	23	69	90	88	104	101	97	58
4	2	30	24	61	83	99	78	80	67
....	3	12	23	49	80	89	104	90	85
2	5	10	12	26	41	92	93	97	76
....	2	4	7	11	17	39	67	103	59
1	......	3	11	7	14	26	37	102	75
....	......	......	2	6	6	8	17	40	65
....	......	......	1	4	5	13	15	36	32
....	1	1	......	1	4	10	3	19	14
....	......	1	2	2	......	8	9	13	16
....	2	......	3	5	2	5	4	8	8
1	......	1	2	......	1	3	5	10	8
....	......	1	......	......	2	1	2	1	4
....	......	......	......	1	1	2	2	1	3
....	......	......	......	......	......	......	3	3	2
....	......	......	......	......	1	......	......	......	2
....	......	......	......	......	......	1	......	2	....
....	......	......	......	......	......	......	......	......	1
....	......	......	......	......	......	......	......	1	....
....	......	......	......	......	......	......	1	......	....
....	......	......	......	......	......	......	......	......	....
1	......	......	1	......	1	2	......	......	....

Table IV.— NEW YORK STATE (exclusive of New York City): *Births* (exclusive of
1920 —

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	AGE					
	32	33	34	35	36	37
Children of foreign-born white mothers — total males	**904**	**883**	**844**	**947**	**736**	**703**
Under 15 years	......	......	......	......	......	....
15 years	......	......	......	......	......	....
16 years	2	......	......	......	......	....
17 years	2	......	1	......	......	....
18 years	4	......	2	......	......	1
19 years	5	4	1	......	1	1
20 years	9	5	2	1	5	2
21 years	12	9	8	9	3	3
22 years	33	22	18	11	8	2
23 years	47	32	29	14	12	6
24 years	57	52	39	27	20	17
25 years	55	57	63	42	24	14
26 years	94	65	42	49	45	29
27 years	71	56	52	54	39	27
28 years	114	90	65	70	50	41
29 years	87	82	72	65	60	37
30 years	76	93	77	103	71	59
31 years	63	59	51	78	41	53
32 years	78	87	91	91	51	65
33 years	35	75	90	91	61	61
34 years	25	37	62	63	58	66
35 years	17	24	33	91	53	54
36 years	4	14	21	37	69	51
37 years	4	5	11	14	19	63
38 years	4	7	6	11	18	23
39 years	3	2	2	7	13	14
40 years	2	4	4	8	7	7
41 years	1	1	1	6	3	....
42 years	......	......	......	3	2	7
43 years	......	......	......	......	1	....
44 years	......	......	......	1	......	....
45–49 years	......	1	1	1	2	....
50 years and over	......	......	......	......	......	....
Age not stated	......	......	......	......	......	....

stillbirths) ***by sex and by the color, nativity and age of mother according to age of father:*** **(Continued)**

OF FATHER

38	39	40	41	42	43	44	45–49	50 and over	Age not stated
751	585	651	307	436	329	301	918	378	83
....	......	......	......	......	......	......	......	......	....
....	......	......	......	......	......	......	......	......	....
....	......	......	......	......	......	......	......	......	4
....	......	......	......	......	......	......	......	......	4
....	1	......	......	1	......	......	......	......	6
3	......	......	......	......	......	......	......	......	7
2	......	......	......	1	......	......	2	......	6
1	2	......	2	1	1	......	......	......	10
4	2	......	1	......	1	1	......	......	3
7	4	1	3	2	1	1	......	......	1
8	3	5	......	4	1	1	1	......	3
21	11	7	1	3	......	2	8	3	3
25	10	10	7	6	1	2	10	4	1
24	13	11	5	7	1	1	4	5	4
47	29	13	5	9	7	2	17	3	3
31	34	29	13	14	7	7	12	5	5
41	39	45	10	12	11	7	26	6	2
51	28	30	20	19	14	10	21	8	2
75	30	45	17	39	8	7	27	8	5
66	33	49	14	24	29	17	25	12	2
52	50	34	11	23	15	27	30	14	....
56	53	53	24	29	23	11	50	16	4
78	54	67	34	30	17	24	76	23	2
47	55	61	25	41	37	27	72	20	2
55	52	72	37	58	25	39	96	38	2
26	45	45	20	26	33	26	80	36	....
14	16	48	24	38	34	14	94	49	1
5	8	10	19	20	24	16	51	19	....
4	6	9	3	17	21	25	81	20	1
4	4	3	7	6	12	18	43	26	....
3	1	2	3	3	2	10	33	25	....
1	2	2	2	3	4	5	56	30	....
....	......	......	......	......	......	1	3	1	....
....	......	......	......	......	......	......	......	7	....

Table IV.— NEW YORK STATE (exclusive of New York City): *Births* (exclusive of 1920 —

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	Total		Age				
		16	17	18	19	20	21
Children of foreign-born white mothers — total females	15,185	....	1	7	15	35	79
Under 15 years	....	....	....	....	....	....	.....
15 years	7	....	....	....	....	....	.....
16 years	19	....	....	2	....	....	1
17 years	77	....	....	1	3	4	4
18 years	170	....	....	....	6	5	5
19 years	281	....	....	1	1	1	11
20 years	359	....	....	....	2	9	8
21 years	415	....	1	....	....	....	18
22 years	568	....	....	1	1	4	15
23 years	681	....	....	....	1	8	4
24 years	879	....	....	2	....	1	4
25 years	892	....	....	....	1	1	3
26 years	914	....	....	....	....	1	.....
27 years	891	....	....	....	....	1	1
28 years	926	....	....	....	....	....	3
29 years	820	....	....	....	....	....	1
30 years	964	....	....	....	....	....	.....
31 years	605	....	....	....	....	....	.....
32 years	806	....	....	....	....	....	.....
33 years	703	....	....	....	....	....	1
34 years	633	....	....	....	....	....	.....
35 years	665	....	....	....	....	....	.....
36 years	624	....	....	....	....	....	.....
37 years	484	....	....	....	....	....	.....
38 years	470	....	....	....	....	....	.....
39 years	352	....	....	....	....	....	.....
40 years	323	....	....	....	....	....	.....
41 years	177	....	....	....	....	....	.....
42 years	181	....	....	....	....	....	.....
43 years	117	....	....	....	....	....	.....
44 years	68	....	....	....	....	....	.....
45–49 years	96	....	....	....	....	....	.....
50 years and over	2	....	....	....	....	....	.....
Age not stated	13	....	....	....	....	....	.....

stillbirths) by sex and by the color, nativity and age of mother according to age of father:
(Continued)

OF FATHER

22	23	24	25	26	27	28	29	30	31
151	**246**	**390**	**505**	**603**	**682**	**834**	**739**	**920**	**706**
......	......	......	......	......	......	......	......	......	......
......	1	......	1	1	2	......	1	1	......
2	2	3	2	1	......	......	1	......	......
8	9	10	7	6	6	6	6	3	......
10	15	28	19	15	16	13	13	10	3
22	22	40	44	35	30	26	13	9	3
23	35	40	33	45	37	28	20	30	13
23	31	41	37	33	43	44	28	28	26
29	49	49	52	60	55	48	41	43	23
14	34	63	68	83	69	55	60	61	84
9	24	45	84	94	84	95	65	88	42
6	7	25	61	58	101	97	70	96	51
2	5	12	31	73	72	108	74	78	69
1	4	10	19	34	73	94	89	83	63
1	......	10	21	22	22	92	70	101	72
......	3	3	9	18	18	38	81	81	71
1	3	2	8	9	21	37	45	92	72
......	......	3	4	5	12	15	16	28	60
......	1	3	2	5	4	9	17	33	40
......	......	1	1	......	4	6	12	16	19
......	......	1	1	......	4	5	7	19	10
......	......	......	1	......	2	5	1	9	16
......	......	......	......	3	3	7	2	5	8
......	......	......	......	2	2	1	2	1	3
......	1	......	......	1	......	2	1	8	2
......	......	......	......	......	......	1	1	1	1
......	......	......	......	......	1	......	1	1	2
......	......	......	......	......	1	......	......	......	1
......	......	......	......	......	......	......	......	......	1
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	1	......	......	1
......	......	......	......	......	......	......	......	......	......
......	......	1	......	......	......	1	......	......	......

Table IV.— NEW YORK STATE (exclusive of New York City): *Births* (exclusive of
1920 —

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	AGE					
	32	33	34	35	36	37
Children born to foreign-born white mothers — total females	**847**	**856**	**798**	**893**	**766**	**613**
Under 15 years	......	......	......	......	......	......
15 years	......	......	......	......	......	......
16 years	......	......	......	......	......	1
17 years	1	......	......	......	1	......
18 years	5	3	......	1	......	......
19 years	8	2	2	3	1	......
20 years	10	3	4	5	3	1
21 years	18	15	5	6	2	1
22 years	24	23	16	11	5	6
23 years	31	32	29	15	7	3
24 years	61	46	41	26	16	15
25 years	64	57	50	54	22	20
26 years	78	73	50	57	47	17
27 years	72	58	61	56	30	39
28 years	91	74	69	60	56	31
29 years	73	72	54	73	54	26
30 years	84	90	86	93	58	44
31 years	60	43	50	42	54	41
32 years	86	81	67	77	70	54
33 years	26	85	63	84	56	53
34 years	17	39	74	51	65	54
35 years	13	22	34	85	70	58
36 years	7	17	13	39	69	55
37 years	6	9	12	22	33	38
38 years	5	4	9	11	25	23
39 years	1	4	3	7	11	14
40 years	3	......	......	10	5	5
41 years	1	2	1	2	1	6
42 years	......	......	3	......	1	4
43 years	......	......	1	1	1	1
44 years	......	......	1	......	......	1
45–49 years	2	1	......	2	1	2
50 years and over	......	......	......	......	1	......
Age not stated	......	1	......	......	1	......

stillbirths) by sex and by the color, nativity and age of mother according to age of father: **(Continued)**

OF FATHER

38	39	40	41	42	43	44	45–49	50 and over	Age not stated
701	**527**	**658**	**329**	**442**	**280**	**257**	**852**	**383**	**75**
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......
1	......	......	......	......	......	......	1	......	2
1	......	......	......	......	......	......	......	......	1
......	......	1	......	......	......	......	......	......	2
......	......	......	......	......	......	1	......	1	5
2	1	1	......	......	......	......	......	1	5
3	1	......	2	2	......	......	1	......	6
4	2	1	1	......	......	1	1	1	2
4	3	......	......	......	1	2	......	2	3
7	7	6	2	3	1	3	2	2	4
10	8	12	1	3	......	2	1	5	6
28	9	7	6	4	2	......	9	2	......
28	20	17	4	4	3	4	12	3	8
48	16	19	10	12	4	5	7	5	5
38	37	19	10	12	4	3	14	8	......
46	25	52	15	18	11	9	30	10	3
41	35	20	12	13	7	10	21	13	1
56	35	47	13	34	21	15	24	10	2
49	51	50	17	23	22	12	35	14	3
46	42	56	21	33	17	21	36	13	1
67	44	58	82	35	20	12	60	20	1
70	31	63	32	47	25	15	83	27	3
57	48	46	34	33	23	19	82	11	......
54	48	64	27	44	32	25	58	29	2
10	40	45	34	33	23	22	61	40	......
16	12	45	18	37	25	24	80	38	......
6	8	12	29	14	8	19	47	18	1
5	3	9	7	23	15	14	67	29	......
2	......	4	1	11	14	10	44	27	......
......	......	1	1	3	1	4	38	18	......
1	1	3	......	1	1	5	38	35	1
......	......	......	......	......	......	......	......	1	......
1	......	......	......	......	......	......	......	......	8

Table IV.— NEW YORK STATE (exclusive of New York City): Births (exclusive of
1920 —

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	Total	AGE					
		16	17	18	19	20	21
Children born to colored mothers — total males	438	....	1	4	5	10	12
Under 15 years	1	....	....	....	....	....	.....
15 years	4	....	....	....	2	....	1
16 years	6	....	1	2	....	....	.....
17 years	9	....	....	1	1	2	1
18 years	21	....	....	1	1	1	2
19 years	22	....	....	....	....	1	2
20 years	42	....	....	....	1	5	4
21 years	19	....	....	....	....	1	1
22 years	18	....	....	....	....	....	.....
23 years	24	....	....	....	....	....	1
24 years	20	....	....	....	....	....	.....
25 years	26	....	....	....	....	....	.....
26 years	24	....	....	....	....	....	.....
27 years	22	....	....	....	....	....	.....
28 years	16	....	....	....	....	....	.....
29 years	13	....	....	....	....	....	.....
30 years	20	....	....	....	....	....	.....
31 years	9	....	....	....	....	....	.....
32 years	14	....	....	....	....	....	.....
33 years	18	....	....	....	....	....	.....
34 years	12	....	....	....	....	....	.....
35 years	8	....	....	....	....	....	.....
36 years	16	....	....	....	....	....	.....
37 years	12	....	....	....	....	....	.....
38 years	10	....	....	....	....	....	.....
39 years	10	....	....	....	....	....	.....
40 years	5	....	....	....	....	....	.....
41 years	5	....	....	....	....	....	.....
42 years	3	....	....	....	....	....	.....
43 years	2	....	....	....	....	....	.....
44 years	3	....	....	....	....	....	.....
45–49 years	1	....	....	....	....	....	.....
50 years and over	....	....	....	....	....	....	.....
Age not stated	3	....	....	....	....	....	.....

stillbirths) *by sex and by the color, nativity and age of mother according to age of father:* (Continued)

OF FATHER

38	39	40	41	42	43	44	45–49	50 and over	Age not stated
21	16	15	5	6	7	7	19	19	19
......	......	......	......	......	......	......	......	......	1
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	2
......	......	......	......	......	......	......	......	......	2
......	......	......	......	......	......	......	......	......	......
......	......	1	......	......	......	......	......	1	4
1	......	......	......	......	......	1	......	1	3
......	......	......	......	1	......	......	......	......	2
......	1	......	......	......	......	......	......	......	......
......	1	1	......	......	......	......	1	1	2
......	......	1	......	......	......	......	......	......	......
......	......	1	......	......	......	1	1	......	......
1	1	1	......	......	......	......	1	......	1
......	1	......	......	1	......	......	1	1	1
1	......	......	......	......	2	......	1	1	......
......	2	......	......	......	......	1	1	......	......
......	......	1	......	......	1	......	......	......	1
......	......	......	......	......	......	......	1	......	......
3	3	......	......	1	......	......	......	......	......
5	1	......	......	......	1	......	1	1	......
1	3	2	......	......	......	......	......	......	......
1	1	......	1	......	......	......	......	1	......
2	......	3	1	1	......	1	2	1	......
4	1	......	......	1	......	......	1	1	......
......	1	4	1	......	1	......	1	1	......
1	......	......	1	......	......	1	1	4	......
1	......	......	......	......	1	......	2	1	......
......	......	......	1	1	1	1	......	1	......
......	......	......	......	......	......	......	1	1	......
......	......	......	......	......	......	......	1	......	......
......	......	......	......	......	......	1	2	......	......
......	......	......	......	......	......	......	......	1	......
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	1	......

Table IV.— NEW YORK STATE (exclusive of New York City): *Births* (exclusive of 1920 —

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	Total	Age					
		16	17	18	19	20	21
Children born to colored mothers — total females	402	....	1	3	5	9	9
Under 15 years	3	....	1	1	....	....	.....
15 years	2	....	....	....	....	....	.....
16 years	3	....	....	....	1	1	.....
17 years	10	....	....	....	1	2	.....
18 years	23	....	....	1	2	2	3
19 years	21	....	....	....	1	....	3
20 years	18	....	....	....	....	2	.....
21 years	23	....	....	1	....	....	1
22 years	28	....	....	....	....	....	1
23 years	34	....	....	....	....	1	.....
24 years	26	....	....	....	....	1	.....
25 years	18	....	....	....	....	....	.....
26 years	21	....	....	....	....	....	.....
27 years	15	....	....	....	....	....	.....
28 years	23	....	....	....	....	....	.....
29 years	18	....	....	....	....	....	1
30 years	28	....	....	....	....	....	.....
31 years	6	....	....	....	....	....	.....
32 years	10	....	....	....	....	....	.....
33 years	17	....	....	....	....	....	.....
34 years	8	....	....	....	....	....	.....
35 years	10	....	....	....	....	....	.....
36 years	5	....	....	....	....	....	.....
37 years	10	....	....	....	....	....	.....
38 years	5	....	....	....	....	....	.....
39 years	5	....	....	....	....	....	.....
40 years	2	....	....	....	....	....	.....
41 years	5	....	....	....	....	....	.....
42 years	2	....	....	....	....	....	.....
43 years	....	....	....	....	....	....	.....
44 years	1	....	....	....	....	....	.....
45–49 years	....	....	....	....	....	....	.....
50 years and over	1	....	....	....	....	....	.....
Age not stated	1	....	....	....	....	....	.....

stillbirths) *by sex and by the color, nativity and age of mother according to age of father* (Continued)

OF FATHER

22	23	24	25	26	27	28	29	30	31
13	25	19	21	15	22	17	14	23	24
......	......	......	......	......	......	......	......	......	......
1	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......
1	1	......	1	......	......	......	......	......	1
......	3	1	1	3	......	1	......	2	1
4	4	1	1	1	......	1	......	......	1
2	1	3	1	2	1	1	......	1	......
1	4	2	2	1	2	1	......	......	1
3	3	4	3	1	2	3	2	2	......
......	4	5	3	2	3	1	1	5	......
1	3	1	3	......	2	2	2	4	1
......	1	1	2	2	2	1	5	......	1
......	1	......	1	1	4	1	......	2	3
......	......	1	......	......	2	2	1	......	2
......	......	......	2	1	......	1	1	1	3
......	......	......	......	......	2	1	......	......	2
......	......	......	......	......	1	......	1	5	4
......	......	......	1	......	......	......	......	......	1
......	......	......	......	......	......	......	......	1	1
......	......	......	......	......	1	......	......	......	1
......	......	......	......	1	......	......	......	......	......
......	......	......	......	......	......	......	1	......	......
......	......	......	......	......	......	1	......	......	......
......	......	......	......	......	......	......	......	......	1
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......

Table IV.— NEW YORK STATE (exclusive of New York City): *Births* (exclusive of 1920 —

SEX OF CHILD, NATIVITY AND AGE OF MOTHER	AGE					
	32	33	34	35	36	37
Children born to colored mothers — total females	**16**	**13**	**6**	**26**	**12**	**8**
Under 15 years	......	......	......	......	......	......
15 years	......	......	......	......	......	......
16 years	......	......	......	......	......	......
17 years	1	......	......	......	......	......
18 years	......	......	......	......	......	......
19 years	......	......	......	1	......	......
20 years	1	......	......	1	......	1
21 years	2	......	......	2	......	......
22 years	......	1	1	......	......	......
23 years	1	......	......	3	......	......
24 years	......	......	......	1	......	......
25 years	1	......	......	......	......	......
26 years	2	1	......	1	2	......
27 years	......	2	......	......	2	1
28 years	......	1	1	5	2	......
29 years	3	......	1	2	......	1
30 years	3	1	1	2	......	2
31 years	1	......	......	......	......	1
32 years	......	1	1	2	1	......
33 years	1	4	1	2	3	......
34 years	......	2	......	......	......	......
35 years	......	......	......	2	2	1
36 years	......	......	......	1	......	......
37 years	......	......	......	......	......	......
38 years	......	......	......	1	......	......
39 years	......	......	......	......	......	1
40 years	......	......	......	......	......	......
41 years	......	......	......	......	......	......
42 years	......	......	......	......	......	......
43 years	......	......	......	......	......	......
44 years	......	......	......	......	......	......
45–49 years	......	......	......	......	......	......
50 years and over	......	......	......	......	......	......
Age not stated	......	......	......	......	......	......

stillbirths) *by sex and by the color, nativity and age of mother according to age of father:* (Concluded)

OF FATHER

38	39	40	41	42	43	44	45–49	50 and over	Age not stated
7	10	7	4	3	10	4	25	13	17
......	......	......	......	......	......	......	......	......	1
......	......	......	......	......	......	......	......	......	1
......	......	......	......	......	......	......	......	......	1
......	......	......	......	......	......	......	......	......	2
......	......	......	......	......	......	......	......	......	3
......	......	......	......	......	......	......	......	......	3
......	......	......	......	......	......	......	......	......	1
......	......	1	......	......	......	......	1	......	1
......	......	1	......	......	......	......	1	......	......
......	1	1	......	......	1	......	2	......	......
1	2	......	......	......	......	......	......	......	2
......	......	......	......	......	1	......	......	1	......
......	......	......	......	......	......	......	1	1	......
1	......	......	......	......	......	......	1	......	......
......	......	1	......	......	1	......	2	1	......
......	2	......	1	......	......	......	1	1	......
......	2	1	......	1	......	......	1	2	1
2	......	......	......	......	......	......	......	......	......
......	......	1	......	......	1	......	1	......	......
......	1	......	......	......	2	1	......	......	......
1	......	......	1	......	1	......	1	......	1
......	......	......	......	......	......	......	3	1	......
......	......	......	......	1	1	......	......	1	......
1	1	......	1	......	......	......	5	1	......
......	1	......	1	......	1	......	1	......	......
1	......	1	......	......	......	1	1	......	......
......	......	......	......	......	......	1	1	......	......
......	......	......	......	1	1	1	1	1	......
......	......	......	......	......	......	......	......	2	......
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	1	......
......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	1	......	......
......	......	......	......	......	......	......	......	......	......

Table V.— STATE OF NEW YORK (exclusive of New York City): *Births* (exclusive
for white children by country of

COLOR AND COUNTRY OF BIRTH OF MOTHERS AND ORDER OF 1920 BIRTH	Total	AGE					
		15 or less	16	17	18	19	20
Children born to white mothers — total*	**101,765**	**120**	**355**	**1,053**	**2,151**	**3,335**	**4,246**
1st birth	29,093	119	335	958	1,824	2,493	2,765
2nd birth	21,594	1	19	87	277	692	1,083
3rd birth	15,797	.....	.....	4	44	129	325
4th birth	10,861	.....	.....	.....	.....	11	57
5th birth	7,692	.....	.....	.....	.....	2	7
6th birth	5,433	.....	.....	.....	.....	.....	1
7th birth	3,830	.....	.....	.....	.....	.....	.....
8th birth	2,601	.....	.....	.....	.....	.....	.....
9th birth	1,731	.....	.....	.....	.....	.....	.....
10th birth	1,181	.....	.....	.....	.....	.....	.....
11th birth	703	.....	.....	.....	.....	.....	.....
12th birth	432	.....	.....	.....	.....	.....	.....
13th birth	255	.....	.....	.....	.....	.....	.....
14th birth	119	.....	.....	.....	.....	.....	.....
15th birth or over	114	.....	.....	.....	.....	.....	.....
Order of birth not stated	329	.....	1	4	6	8	8
Children of mothers born in United States — total	**70,608**	**108**	**303**	**889**	**1,808**	**2,756**	**3,522**
1st birth	24,289	107	288	810	1,556	2,099	2,350
2nd birth	16,858	1	14	72	217	556	892
3rd birth	10,864	.....	.....	3	30	84	240
4th birth	6,534	.....	.....	.....	.....	8	29
5th birth	4,116	.....	.....	.....	.....	1	5
6th birth	2,759	.....	.....	.....	.....	.....	.....
7th birth	1,812	.....	.....	.....	.....	.....	.....
8th birth	1,163	.....	.....	.....	.....	.....	.....
9th birth	765	.....	.....	.....	.....	.....	.....
10th birth	498	.....	.....	.....	.....	.....	.....
11th birth	319	.....	.....	.....	.....	.....	.....
12th birth	190	.....	.....	.....	.....	.....	.....
13th birth	108	.....	.....	.....	.....	.....	.....
14th birth	56	.....	.....	.....	.....	.....	.....
15th birth or over	46	.....	.....	.....	.....	.....	.....
Order of birth not stated	231	.....	1	4	5	8	6

N.B.— In determining the number of child in order of birth, previous stillbirths in some
* Total includes three children for whom the country of birth of mother was not stated.

of stillbirths) *with the number of child in order of birth, by color and age of mother and birth of mother*: 1920

OF MOTHERS

21	22	23	24	25	26	27	28	29	30	31	32
4,688	5,466	5,965	6,300	6,450	6,467	5,881	5,820	5,134	5,274	4,076	4,400
2,568	2,638	2,464	2,226	2,020	1,745	1,399	1,219	917	765	583	485
1,393	1,713	1,845	1,828	1,825	1,738	1,437	1,363	1,167	1,072	778	711
567	800	1,099	1,288	1,310	1,276	1,236	1,172	1,003	963	765	745
121	228	411	647	789	929	880	860	753	840	596	708
21	56	103	221	357	497	528	628	569	666	512	600
5	12	23	57	97	179	257	320	399	457	374	468
1	....	6	12	25	68	75	172	187	290	227	288
1	3	2	2	12	10	34	43	70	122	138	204
1	....	....	2	1	3	9	19	30	50	46	94
.....	....	....	1	.....	2	2	6	16	17	22	49
.....	....	....	....	1	.....	.....	1	2	5	13	22
.....	....	....	....	.....	.....	.....	.....	2	2	6	6
.....	....	....	....	.....	.....	.....	.....	.....	2	.....	2
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	1
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
10	16	12	16	13	20	24	17	19	23	16	17
3,796	4,328	4,586	4,534	4,597	4,623	4,078	3,874	3,445	3,355	2,776	2,764
2,134	2,176	2,081	1,854	1,680	1,471	1,157	1,005	751	638	501	404
1,155	1,369	1,426	1,321	1,377	1,360	1,132	1,055	917	832	620	563
399	581	740	814	819	840	825	772	678	687	581	525
81	148	256	374	436	530	479	481	454	454	388	437
12	35	57	120	195	268	258	291	275	308	291	322
3	7	11	33	59	98	141	146	202	211	173	220
1	....	3	5	16	37	36	77	99	118	106	126
1	1	2	....	5	5	21	21	33	56	67	84
.....	....	....	1	.....	.....	6	9	16	27	21	35
.....	....	....	....	.....	1	2	5	9	7	11	21
.....	....	....	....	.....	.....	.....	.....	.....	1	5	11
.....	....	....	....	.....	.....	.....	.....	2	1	4	2
.....	....	....	....	.....	.....	.....	.....	.....	1	.....	1
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
10	11	10	12	10	13	21	12	9	14	8	13

cases may have been included.

Table V — STATE OF NEW YORK (exclusive of New York City): *Births* (exclusive *for white children by country of*

COLOR AND COUNTRY OF BIRTH OF MOTHERS AND ORDER OF 1920 BIRTH	AGE						
	33	34	35	36	37	38	39
Children born to white mothers — total	3,747	3,485	3,138	2,931	2,391	2,375	1,761
1st birth	336	301	255	197	129	115	67
2d birth	534	496	407	315	217	208	129
3d birth	623	551	445	387	290	245	146
4th birth	563	487	417	380	285	280	186
5th birth	508	448	398	344	274	306	191
6th birth	443	396	366	344	270	256	205
7th birth	348	325	291	313	285	246	205
8th birth	184	213	232	252	241	217	163
9th birth	108	123	163	177	147	187	152
10th birth	55	65	81	99	116	136	136
11th birth	17	37	41	58	69	85	68
12th birth	9	15	21	30	33	44	51
13th birth	2	7	3	15	13	27	24
14th birth	.....	3	2	9	9	8	9
15th birth or over	1	.....	4	3	5	2	20
Order of birth not stated	16	18	12	8	8	13	9
Children of mothers born in United States — total	2,307	2,234	1,845	1,675	1,398	1,352	1,023
1st birth	282	247	206	158	103	93	55
2d birth	408	393	324	239	175	151	89
3d birth	453	414	323	285	208	184	111
4th birth	343	322	250	236	205	183	128
5th birth	278	247	220	193	157	157	134
6th birth	222	213	179	163	135	138	116
7th birth	142	159	125	137	133	128	112
8th birth	88	109	82	92	113	97	79
9th birth	44	56	66	78	61	75	71
10th birth	23	31	27	36	46	63	48
11th birth	8	17	21	25	31	37	29
12th birth	4	9	11	15	17	16	21
13th birth	1	4	1	7	2	15	16
14th birth	.....	1	1	2	5	6	3
15th birth or over	.....	.....	1	2	2	1	7
Order of birth not stated	11	12	8	7	5	8	4

of stillbirths) *with the number of child in order of birth, by color and age of mother an birth of mother:* **1920** — (Continued)

OF MOTHERS

40	41	42	43	44	45	46	47	48	49	50 and over	Age not stated
1,535	**949**	**886**	**522**	**345**	**224**	**110**	**47**	**25**	**15**	**11**	**96**
57	34	27	16	2	6	3	1	2	.....	.....	22
92	62	40	21	15	4	1	2	1	.....	.....	21
144	88	59	31	29	8	5	2	.....	.....	.....	18
168	99	73	37	24	17	4	1	2	1	.....	7
159	97	92	44	31	14	3	2	.....	3	1	1)
167	113	92	60	30	19	11	3	1	2	2	4
149	86	108	50	32	19	9	4	5	.....	1	3
155	101	78	44	31	20	18	3	3	1	2	2
131	78	77	62	27	26	11	1	3	.....	2	1
117	63	81	44	26	23	8	9	2	2	1	2
83	50	43	38	29	15	11	9	3	1	.....	2
40	36	54	20	24	22	9	5	1	1	1	......
39	19	27	33	14	15	9	.....	1	2	1	......
16	8	22	12	11	7	2	.....	.....	.....	.....	......
13	6	10	9	18	9	6	5	1	2	.....	......
5	....	3	1	2	.....	.....	.....	.....	.....	.....	4
845	**576**	**505**	**281**	**193**	**117**	**60**	**20**	**11**	**6**	**4**	**69**
39	29	22	13	2	5	3	1	1	.....	.....	18
76	46	35	15	8	2	1	2	.....	.....	.....	15
101	60	43	22	23	4	4	2	.....	.....	.....	14
115	76	56	27	19	13	1	.....	2	.....	.....	3
90	74	51	30	24	10	2	1	.....	1	.....	9
103	68	47	32	20	9	5	1	.....	1	.....	3
78	54	59	26	18	9	4	2	1	.....	.....	1
56	50	37	20	16	9	14	.....	1	1	1	2
52	36	40	30	15	16	5	.....	2	.....	2	1
50	29	36	20	9	13	3	3	1	2	1	1
41	27	21	16	14	8	3	2	1	.....	.....	1
17	14	25	7	10	4	7	3	1	.....	.....	......
13	7	12	11	5	6	4	.....	1	1	.....	......
7	5	13	6	2	4	1	.....	.....	.....	.....	......
5	1	5	5	6	5	3	3	.....	.....	.....	......
2	....	3	1	2	.....	.....	.....	.....	.....	.....	1

Table V — STATE OF NEW YORK (exclusive of New York City): *Births* (exclusive
for white children by country of

COLOR AND COUNTRY OF BIRTH OF MOTHERS AND ORDER OF 1920 BIRTH	Total	AGE					
		15 or less	16	17	18	19	20
Children of foreign-born white mothers — total	**31,154**	**12**	**51**	**164**	**343**	**579**	**724**
1st birth	4,803	12	46	148	268	394	415
2d birth	4,736	.....	5	15	60	136	191
3d birth	4,932	.....	.....	1	14	45	85
4th birth	4,327	.....	.....	.....	.....	3	28 1
5th birth	3,576	.....	.....	.....	.....	1	2
6t birth	2,674	.....	.....	.....	.....	.....	
7th birth	2,018	.....	.....	.....	.....	.....	......
8th birth	1,438	.....	.....	.....	.....	.....	......
9th birth	966	.....	.....	.....	.....	.....	......
10th birth	683	.....	.....	.....	.....	.....	......
11th birth	384	.....	.....	.....	.....	.....	......
12th birth	242	.....	.....	.....	.....	.....	......
13th birth	147	.....	.....	.....	.....	.....	......
14th birth	63	.....	.....	.....	.....	.....	......
15th birth or over	68	.....	.....	.....	.....	.....	......
Order of birth not stated	97	.....	.....	.....	1	.....	2
Children of mothers born in England, Scotland, Wales — total	**1,534**	.....	.....	**8**	**8**	**26**	**30**
1st birth	475	.....	.....	8	7	23	21
2d birth	361	.....	.....	.....	1	2	7
3d birth	243	.....	.....	.....	.....	1	1
4th birth	163	.....	.....	.....	.....	.....	1
5th birth	88	.....	.....	.....	.....	.....	......
6th birth	75	.....	.....	.....	.....	.....	......
7th birth	35	.....	.....	.....	.....	.....	......
8th birth	30	.....	.....	.....	.....	.....	......
9th birth	21	.....	.....	.....	.....	.....	......
10th birth	17	.....	.....	.....	.....	.....	......
11th birth	6	.....	.....	.....	.....	.....	......
12th birth	6	.....	.....	.....	.....	.....	......
13th birth	4	.....	.....	.....	.....	.....	......
14th birth	4	.....	.....	.....	.....	.....	......
15th birth or over	1	.....	.....	.....	.....	.....	......
Order of birth not stated	5	.....	.....	.....	.....	.....	......

of stillbirths) *with the number of child in order of birth, by color and age of mother and birth of mother:* 1920 — (Continued)

OF MOTHERS

21	22	23	24	25	26	27	28	29	30	31	32
892	1,138	1,429	1,766	1,852	1,844	1,803	1,946	1,689	1,919	1,300	1,636
434	462	433	372	340	274	242	214	166	127	82	81
238	344	419	507	448	378	305	308	250	240	158	148
168	219	359	474	490	436	411	400	325	276	184	220
40	80	155	273	353	399	401	379	299	386	208	271
9	21	46	101	162	229	270	337	294	358	221	278
2	5	12	24	38	81	116	174	197	246	201	248
.....	....	3	7	9	31	39	95	88	172	121	162
.....	2	....	2	7	5	13	22	37	66	71	120
1	....	....	1	1	3	3	10	14	23	25	59
.....	....	....	1	.....	1	.....	1	7	10	11	28
.....	....	....	....	1	.....	.....	1	2	4	8	11
.....	....	....	....	.....	.....	.....	.....	.....	1	2	4
.....	....	....	....	.....	.....	.....	.....	.....	1	.....	1
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	1
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	5	2	4	3	7	3	5	10	9	8	4
58	66	59	75	87	78	73	72	80	80	65	86
42	44	41	37	46	32	26	25	21	15	13	12
15	18	13	27	24	24	19	19	27	22	22	20
1	4	4	9	11	16	16	12	16	22	11	19
.....	....	1	2	5	4	8	10	8	14	12	17
.....	....	....	....	1	1	4	3	3	3	5	5
.....	....	....	....	.....	1	.....	1	3	2	2	10
.....	....	....	....	.....	.....	.....	1	1	1	.....	1
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	1	.....	.....	1
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	1	.....	1	.....	1

Table V.— STATE OF NEW YORK (exclusive of New York City): *Births* (exclusive
for white children by country of

COLOR AND COUNTRY OF BIRTH OF MOTHERS AND ORDER OF 1920 BIRTH	AGE						
	33	34	35	36	37	38	39
Children of Austrian mothers, except Austrian-Polish — total	**133**	**103**	**100**	**102**	**67**	**80**	**58**
1st birth	1	3	3	2	1	.....	......
2d birth	9	6	3	2	2	2	......
3d birth	12	9	10	8	8	2	2
4th birth	19	7	12	6	6	5	6
5th birth	24	14	19	16	8	12	6
6th birth	20	20	11	14	9	11	4
7th birth	23	22	16	18	10	11	6
8th birth	10	12	16	13	13	18	10
9th birth	11	3	5	6	5	6	9
10th birth	1	4	4	10	4	5	7
11th birth	2	.....	.....	3	2	4	6
12th birth	1	1	1	2	2	3	1
13th birth	.....	.....	.....	.....	2	.....	1
14th birth	.....	.....	.....	2	.....	.....	......
15th birth or over	.....	.....	.....	.....	.....	1	......
Order of birth not stated	.....	2	.....	.....	.....	.....	......
Children of mothers born in Hungary — total	**30**	**23**	**24**	**23**	**22**	**18**	**13**
1st birth	3	1	1	.....	1	.....	......
2d birth	6	.....	2	2	1	.....	2
3d birth	2	3	2	3	3	1	1
4th birth	5	2	3	2	.....	1	......
5th birth	5	5	7	1	1	6	1
6th birth	4	6	1	7	3	5	5
7th birth	2	3	3	2	2	.....	2
8th birth	2	2	.....	5	4	1	......
9th birth	.....	.....	.....	1	1	2	......
10th birth	1	1	3	.....	3	1	1
11th birth	.....	.....	1	.....	1	1	1
12th birth	.....	.....	.....	.....	1	.....	......
13th birth	.....	.....	.....	.....	.....	.....	......
14th birth	.....	.....	.....	.....	.....	.....	......
15th birth or over	.....	.....	.....	.....	.....	.....	......
Order of birth not stated	.....	.....	1	.....	1	.....	......

of stillbirths) *with the number of child in order of birth, by color and age of mother and birth of mother:* 1920 — (Continued)

OF MOTHERS

40	41	42	43	44	45	46	47	48	49	50 or over	Age not stated
50	11	25	12	7	8	5	1	1	1	.....	6
1	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
2	1	....	....	.....	.....	.....	.....	.....	.....	.....	2
3	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
4	....	1	....	.....	1	.....	.....	.....	.....	.....	3
4	1	3	1	1	.....	.....	.....	.....	.....	.....	1
5	3	4	1	.....	2	.....	.....	.....	.....	.....	......
3	....	2	2	2	.....	.....	.....	1	.....	.....	......
10	3	3	1	1	.....	1	.....	.....	.....	.....	......
7	1	5	....	1	1	1	.....	.....	.....	.....	......
4	....	2	....	1	1	.....	.....	.....	.....	.....	......
4	1	....	2	.....	.....	2	1	.....	.....	.....	......
2	1	3	1	1	2	.....	.....	.....	.....	.....	......
1	....	1	4	.....	1	1	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	1	....	.....	.....	.....	.....	.....	1	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
12	3	9	4	3	.....	.....	.....	.....	.....	1	1
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
2	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
2	....	....	....	.....	.....	.....	.....	.....	.....	.....	1
1	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
2	....	1	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
2	....	2	1	2	.....	.....	.....	.....	.....	1	......
1	....	2	1	.....	.....	.....	.....	.....	.....	.....	......
.....	2	1	1	1	.....	.....	.....	.....	.....	.....	......
1	....	1	1	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
1	1	2	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......

Table V.— STATE OF NEW YORK (exclusive of New York City): *Births* (exclusive *for white children by country of*

COLOR AND COUNTRY OF BIRTH OF MOTHERS AND ORDER OF 1920 BIRTH	Total	AGE					
		15 or less	16	17	18	19	20
Children of mothers born in Poland — total	**6,291**	.....	**1**	**15**	**46**	**58**	**87**
1st birth	564	.....	1	13	33	36	45
2d birth	901	.....	.....	2	11	19	27
3d birth	1,155	.....	.....	.....	2	3	9
4th birth	967	.....	.....	.....	.....	.....	5
5th birth	800	.....	.....	.....	.....	.....	1
6th birth	579	.....	.....	.....	.....	.....	......
7th birth	473	.....	.....	.....	.....	.....	......
8th birth	305	.....	.....	.....	.....	.....	......
9th birth	216	.....	.....	.....	.....	.....	......
10th birth	126	.....	.....	.....	.....	.....	......
11th birth	73	.....	.....	.....	.....	.....	......
12th birth	47	.....	.....	.....	.....	.....	......
13th birth	36	.....	.....	.....	.....	.....	......
14th birth	15	.....	.....	.....	.....	.....	......
15th birth or over	11	.....	.....	.....	.....	.....	......
Order of birth not stated	23	.....	.....	.....	.....	.....	......
Children of French-Canadian mothers — total	**300**	**1**	**2**	**4**	**2**	**15**	**12**
1st birth	74	1	2	4	2	13	7
2d birth	58	.....	.....	.....	.....	.....	4
3d birth	43	.....	.....	.....	.....	2	1
4th birth	24	.....	.....	.....	.....	.....	......
5th birth	17	.....	.....	.....	.....	.....	......
6th birth	20	.....	.....	.....	.....	.....	......
7th birth	16	.....	.....	.....	.....	.....	......
8th birth	14	.....	.....	.....	.....	.....	......
9th birth	9	.....	.....	.....	.....	.....	......
10th birth	7	.....	.....	.....	.....	.....	......
11th birth	4	.....	.....	.....	.....	.....	......
12th birth	4	.....	.....	.....	.....	.....	......
13th birth	1	.....	.....	.....	.....	.....	......
14th birth	2	.....	.....	.....	.....	.....	......
15th birth or over	4	.....	.....	.....	.....	.....	......
Order of birth not stated	3	.....	.....	.....	.....	.....	......

of stillbirths) *with the number of child in order of birth, by color and age of mother and birth of mother:* 1920 — (Continued)

OF MOTHERS

21	22	23	24	25	26	27	28	29	30	31	32
118	203	315	429	479	479	418	486	386	447	258	301
42	63	62	63	54	38	33	23	19	9	5	4
46	76	109	127	116	99	66	54	33	42	14	15
28	50	101	153	158	133	114	123	73	68	25	25
1	7	32	63	98	126	98	116	82	99	45	50
1	4	7	17	43	56	76	89	83	92	61	58
.....	....	2	2	6	13	16	49	49	72	51	60
.....	....	1	2	2	9	11	22	30	41	35	40
.....	2	....	....	2	1	3	6	7	8	15	30
.....	....	....	1	.....	.....	.....	2	4	9	2	9
.....	....	....	....	.....	1	.....	.....	2	.....	2	5
.....	....	....	....	.....	.....	.....	.....	1	1	1	3
.....	....	....	....	.....	.....	.....	.....	.....	1	.....	1
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	1
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	1	1	1	.....	3	1	2	3	5	2	......
14	12	13	25	11	10	13	16	6	14	15	15
5	6	5	8	4	1	1	4	.....	1	1	3
5	4	4	9	2	3	2	5	1	4	2	1
3	1	3	7	2	4	4	4	2	3	.....	2
1	1	....	1	2	.....	4	.....	.....	3	3	1
.....	....	1	....	1	1	1	1	1	.....	3	1
.....	....	....	....	.....	1	.....	1	2	1	1	......
.....	....	....	....	.....	.....	.....	1	.....	.....	.....	1
.....	....	....	....	.....	.....	1	.....	.....	1	1	2
.....	....	....	....	.....	.....	.....	.....	.....	.....	2	4
.....	....	....	....	.....	.....	.....	.....	.....	1	1	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	1	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......
.....	....	....	....	.....	.....	.....	.....	.....	.....	.....	......

Table V.— STATE OF NEW YORK (exclusive of New York City): *Births* (exclusive *for white children by country of*

COLOR AND COUNTRY OF BIRTH OF MOTHERS AND ORDER OF 1920 BIRTH	AGE						
	33	34	35	36	37	38	39
Children of mothers born in Poland — total	**305**	**226**	**248**	**229**	**153**	**161**	**118**
1st birth	2	4	2	4	2	2	.....
2d birth	14	4	8	10	.....	2	1
3d birth	26	15	16	12	6	4	1
4th birth	39	18	33	23	6	13	5
5th birth	59	43	28	27	17	17	6
6th birth	60	46	29	39	28	17	12
7th birth	43	42	43	42	33	19	18
8th birth	30	24	42	34	26	17	18
9th birth	19	19	26	16	20	29	22
10th birth	8	8	13	15	4	15	16
11th birth	2	1	7	4	6	13	9
12th birth	.....	.....	1	3	1	9	6
13th birth	.....	2	.....	.....	2	3	1
14th birth	.....	.....	.....	.....	1	1	2
15th birth or over	.....	.....	.....	.....	1	.....	1
Order of birth not stated	3	.....	.....	.....	.....	.....	.....
Children of French-Canadian mothers — total	**14**	**8**	**8**	**12**	**9**	**9**	**13**
1st birth	.....	.....	.....	4	1	1	.....
2d birth	2	.....	2	1	.....	1	3
3d birth	1	1	1	.....	.....	1	1
4th birth	4	2	.....	1	1	.....	.....
5th birth	.....	2	1	.....	1	1	.....
6th birth	1	1	.....	2	1	1	2
7th birth	3	.....	1	2	.....	2	1
8th birth	.....	1	1	2	.....	1	.....
9th birth	1	.....	.....	.....	1	.....	1
10th birth	.....	1	1	.....	1	1	.....
11th birth	.....	.....	1	.....	.....	.....	2
12th birth	2	.....	.....	.....	1	.....	.....
13th birth	.....	.....	.....	.....	1	.....	.....
14th birth	.....	.....	.....	.....	.....	.....	.....
15th birth or over	.....	.....	.....	.....	.....	.....	2
Order of birth not stated	.....	.....	.....	.....	1	.....	1

of stillbirths) *with the number of child in order of birth, by color and age of mother and birth of mother:* 1920 — (Continued)

OF MOTHERS

40	41	42	43	44	45	46	47	48	49	50 or over	Age not stated
118	49	45	30	36	24	11	1	3	1	1	6
1	....	2	1	....	....	....	....	....	....	....	1
1	1	....	1	....	1	....	....	....	....	....	2
4	1	1	....	2	1	1	....	....	....	....	....
5	1	1	1	....	....	....	....	....	....	....	....
8	2	8	....	2	....	....	....	....	....	....	....
11	5	2	2	2	2	3	....	....	....	....	1
18	8	4	2	2	2	1	....	2	....	....	1
17	6	4	4	3	2	1	1	1	....	1	....
16	9	2	3	4	2	2	....	....	....	....	....
16	3	7	2	3	4	2	....	....	....	....	....
7	5	3	1	6	3	....	....	....	....	....	....
7	5	4	2	5	2	....	....	....	....	....	....
5	2	8	7	2	3	....	....	....	....	....	....
1	....	3	4	3	....	....	....	....	....	....	....
1	1	1	....	2	2	1	....	....	1	....	....
....	....	....	....	....	....	....	....	....	....	....	1
7	6	7	2	2	2	....	....	....	....	1	....
....	....	....	....	....	....	....	....	....	....	....	....
2	....	....	....	1	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....
....	....	2	....	....	....	....	....	....	....	....	....
1	3	....	1	....	....	....	....	....	....	1	....
2	....	1	1	....	1	....	....	....	....	....	....
1	2	1	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....
....	....	1	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	1	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....
....	....	1	....	1	....	....	....	....	....	....	....
....	1	1	....	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....

Table VI.— STATE OF NEW YORK (exclusive of New York City): ***Stillbirths: number of child in order of birth, age of mother, legitimacy, and plural births,***

SEX, MONTH OF BIRTH, ATTENDANT AT BIRTH, NUMBER IN ORDER OF BIRTH, ETC.	Total stillbirths	STILLBORN						
			COUNTRY					
				Foreign				
		Total	United States	Total	England, Scotland, Wales	Ireland	Germany	German Poland
Total stillbirths	3,784	3,732	2,585	1,146	63	56	48	3
Sex								
Males	2,183	2,161	1,481	679	40	25	27	2
Females	1,601	1,571	1,104	467	23	31	21	1
Month of birth								
January	356	351	229	122	3	2	5	1
February	391	388	293	95	2	4	7	.....
March	308	304	212	92	4	2	3	.....
April	315	312	204	108	7	5	6	.....
May	332	322	225	97	4	2	4	.....
June	277	273	187	86	6	4	4	1
July	317	313	219	94	7	8	6	.....
August	297	292	219	73	2	8	1	.....
September	277	276	180	96	7	5	3	.....
October	298	295	188	107	8	5	5	.....
November	318	312	222	89	7	7	1	.....
December	298	294	207	87	6	4	3	1
Attendant at birth								
Physician	3,687	3,637	2,568	1,068	62	56	45	3
Midwife	91	89	16	73	....	....	3	.....
Other	5	5	1	4	1	....	....	.....
No attendant or not stated*	1	1	......	1	....	....	....	.....
Number of birth								
1st child	1,298	1,278	1,054	224	17	18	9	.....
2nd child	580	575	457	118	14	10	4	.....
3rd child	435	427	292	135	5	8	6	.....
4th child	380	374	234	140	7	4	8	2
5th child	289	287	161	126	6	7	4	.....
6th child	199	196	108	88	5	3	5	.....
7th child	165	163	79	84	3	3	3	.....
8th child	90	89	36	53	....	....	1	.....
9th child	95	93	43	49	2	....	2	.....
10th child	74	73	27	46	2	1	....	1
11th child	46	46	23	23	....	....	2	.....
12th child	18	18	5	13	1	....	....	.....
13th child	22	20	7	13	....	....	2	.....
14th child	10	10	5	5	....	....	1	.....
15th child	3	3	1	2	....	....	....	.....
16th child	5	5	2	3	....	....	....	.....
17th child	3	3	1	2	....	....	....	.....
18th child	2	2	......	2	....	....	....	.....
19th child	......	....	......	......	....	....	....	.....
20th child or over	......	....	......	......	....	....	....	.....
Unknown or not stated	70	70	50	20	1	2	1	.....

N.B.— In determining the number of child in order of birth, previous stillbirths in some

* About 100 stillbirths are certified annually by health officers or coroner's physicians, who

physicians.

Distribution of stillbirths to mothers of 1920, by sex, month of birth, attendant at birth according to color, and for white children by country of birth of mother: 1920

CHILDREN OF WHITE MOTHERS — OF BIRTH OF MOTHER — country: Italy	Russia	Russian Poland	Austria	Austrian Poland	Hungary	Poland, unspecified	Total, Poland	Canada (French)	Canada (other)	Total, Canada	Norway, Sweden, Denmark	Other foreign countries	Country not stated	STILLBORN CHILDREN OF COLORED MOTHERS: Total	Negro	American Indian
419	82	19	104	12	13	154	188	12	88	100	18	55	1	52	49	3
242	53	9	69	6	8	95	112	5	50	55	12	36	1	22	20	2
177	29	10	35	6	5	59	76	7	38	45	6	19	...	30	29	1
42	10	5	11	2	1	17	25	..	15	15	2	6	...	5	5	....
35	5	1	4	1	3	16	18	2	4	6	1	10	...	3	3	....
34	3	2	13	3	..	15	20	1	7	8	1	4	...	4	3	1
36	7	2	12	2	2	12	16	1	9	10	2	5	...	3	3	....
36	6	2	9	1	..	14	17	2	8	10	3	6	...	10	9	1
35	5	2	12	..	1	10	13	1	3	4	2	...	...	4	4	....
33	8	..	7	..	1	14	14	..	8	8	...	2	...	4	4	....
27	7	..	6	2	..	6	8	1	7	8	...	6	...	5	4	1
33	9	2	7	..	2	17	19	..	6	6	1	4	...	1	1	....
38	7	2	10	..	1	17	19	1	7	8	...	6	...	3	3	....
31	6	..	9	1	1	11	12	1	8	9	3	3	1	6	6	....
39	9	1	4	..	1	5	7	2	6	8	3	3	...	4	4	....
377	77	19	96	11	13	138	171	12	87	99	18	54	1	50	47	3
41	4	..	7	1	..	15	16	..	1	1	...	1	...	2	2	....
1	1	..	1	..	..	..	..	..	...	...	...	...	...	...	...	....
...	..	..	..	..	..	1	1	..	...	...	...	...	...	...	...	....
68	17	2	9	..	3	20	22	1	30	31	8	22	...	20	18	2
31	10	1	10	2	..	12	15	3	17	20	1	3	...	5	5	....
39	13	6	16	3	..	20	29	1	10	11	4	4	...	8	7	1
43	14	5	14	3	1	20	30	..	7	7	2	10	...	6	6	....
47	13	1	13	..	3	22	23	..	4	4	2	4	...	2	2	....
37	4	..	12	..	1	16	16	2	1	3	...	2	...	3	3	....
34	4	1	8	2	3	13	16	2	4	6	...	4	...	2	2	....
27	2	1	9	1	..	8	10	..	4	4	...	...	...	1	1	....
24	2	1	5	..	1	8	9	1	1	2	1	1	1	2	2	....
24	2	..	2	1	..	7	9	1	5	6	...	...	...	1	1	....
12	..	..	8	..	..	2	2	..	1	1	...	3	...	...	...	....
8	..	..	..	..	..	2	2	1	1	2	...	...	...	...	...	....
9	..	..	1	..	..	1	1	..	...	...	...	...	...	2	2	....
2	1	..	..	..	..	1	1	..	...	...	...	...	...	...	...	....
...	..	1	..	..	..	1	2	..	...	...	...	...	...	...	...	....
2	..	..	..	..	..	..	..	..	1	1	...	...	...	...	...	....
1	..	..	1	..	..	..	..	..	...	...	...	...	...	...	...	....
1	..	..	..	..	..	..	..	..	1	1	...	...	...	...	...	....
...	..	..	..	..	..	..	..	..	...	...	...	...	...	...	...	....
...	..	..	..	..	..	..	..	..	...	...	...	...	...	...	...	....
10	..	..	1	..	1	1	1	..	1	1	...	2	...	...	...	....

cases may have been included.
were not actually the medical attendants; these are included in the number attended by

Table VI.— STATE OF NEW YORK (exclusive of New York City): *Stillbirths: number of child in order of birth, age of mother, legitimacy, and plural births, accord*

SEX, MONTH OF BIRTH, ATTENDANT AT BIRTH, NUMBER IN ORDER OF BIRTH, ETC.	Total still-births	STILLBORN						
		Total	COUNTRY					
			United States	Foreign				
				Total	England, Scotland, Wales	Ireland	Germany	German Poland
Age of mother								
Under 15 years	3	3	3	......	....	....	....	.....
15–19 years	251	246	204	42	1	....	1	.....
20–24 years	845	829	680	149	7	3	3	.....
25–29 years	958	948	673	275	16	14	7	1
30–34 years	798	784	494	290	18	20	15	1
35–39 years	610	605	350	255	15	15	10	1
40–44 years	242	240	128	112	5	4	10	.....
45–49 years	41	41	22	19	1	....	2	.....
50 and over	2	2	2	......	....	....	....	.....
Age unknown or not stated	34	34	29	4	....	....	....	.....
Legitimacy								
Legitimate	3,714	3,664	2,529	1,135	63	55	47	3
Illegitimate	70	68	56	11	....	1	1	.....
Plural births								
Twins (individuals)	190	188	128	60	5	1	6	.....
Triplets (individuals)	1	1	1	......	....	....	....	.....

*About 100 stillbirths are certified annually by health officers and coroners' physicians, who physicians.

Distribution of stillbirths to mothers of 1920, *by sex, month of birth, attendant at birth, ing to color, and for white children by country of birth of mother:* 1920 — Concluded

CHILDREN OF WHITE MOTHERS														STILLBORN CHILDREN OF COLORED MOTHERS		
OF BIRTH OF MOTHER																
country																
Italy	Russia	Russian Poland	Austria	Austrian Poland	Hungary	Poland, unspecified	Total, Poland	Canada (French)	Canada (other)	Total, Canada	Norway, Sweden, Denmark	Other foreign countries	Country not stated	Total	Negro	American Indian
...	..	..	..	..	..	..	..	..	...	...	...	...	...	...	...	....
23	2	..	2	..	..	4	4	..	7	7	...	2	...	5	5	....
55	11	1	12	2	4	18	21	2	17	19	...	14	...	16	16	....
88	26	6	24	4	1	41	52	2	25	27	8	12	...	10	8	2
93	25	8	26	3	5	42	54	2	14	16	7	11	...	14	13	1
105	8	3	31	2	2	33	39	4	17	21	2	7	...	5	5	....
51	4	1	7	1	1	11	13	2	7	9	...	8	...	2	2	....
3	6	..	2	..	..	2	2	..	1	1	1	1	...	...	...	....
...	..	..	..	..	..	..	..	..	...	...	...	...	...	...	...	....
1	..	..	..	..	..	3	3	..	...	...	...	...	1	...	...	....
418	82	18	103	12	13	154	187	12	85	97	17	53	...	50	47	3
1	..	1	1	..	..	..	1	..	3	3	1	2	1	2	2	....
16	4	..	4	..	..	8	8	..	8	8	2	6	...	2	2	....
...	..	..	..	..	..	..	..	..	...	...	...	...	...	...	...	....

were not actually the medical attendants; these are included in the number attended by

Table VII.— STATE OF NEW YORK (exclusive of New York City): *Deaths under year of life:* 1920

CAUSE OF DEATH	Sex	Total	AGE — DAYS UNDER 1 MONTH — Under 1 day	1–7	8–14	15–21	22–31	Total under 1 month
All Causes	M	5,164	1,112	894	301	217	181	2,705
	F	3,822	806	674	223	144	106	1,953
	Total	8,986	1,918	1,568	524	361	287	4,658
Communicable diseases	M	305	....	6	4	3	7	20
(1–14 inc.)	F	244	1	3	......	7	7	18
	Total	549	1	9	4	10	14	38
Respiratory diseases	M	707	3	24	37	17	37	118
(28, 29, 86–98 inc.)	F	508	1	20	17	17	19	74
	Total	1,215	4	44	54	34	56	192
Gastrointestinal diseases	M	1,061	1	28	33	44	47	153
(103, 104)	F	824	1	23	24	35	25	108
	Total	1,885	2	51	57	79	72	261
Congenital malformation	M	382	92	140	26	15	13	286
(150)	F	311	90	97	25	18	11	241
	Total	693	182	237	51	33	24	527
Premature birth	M	1,273	707	352	84	59	28	1,230
(151 A)	F	948	493	280	88	27	20	908
	Total	2,221	1,200	632	172	86	48	2,138
Congenital debility	M	325	48	63	28	28	11	178
(151 B)	F	224	27	48	24	14	11	124
	Total	549	75	111	52	42	22	302
Injuries at birth	M	343	190	121	19	6	4	340
(152 A)	F	243	136	97	8	1	......	242
	Total	586	326	218	27	7	4	582
Other causes peculiar to early infancy	M	143	45	53	18	10	10	136
(152B, 153)	F	120	40	51	13	7	1	112
	Total	263	85	104	31	17	11	248
All other causes	M	625	26	107	52	35	24	244
	F	400	17	55	24	18	12	126
	Total	1,025	43	162	76	53	36	370

one year of age from important causes, by sex, and for certain subdivisions of the first

AT DEATH

MONTHS UNDER 1 YEAR										
1	2	3	4	5	6	7	8	9	10	11
435	320	270	249	243	193	172	194	134	116	133
286	255	218	188	172	150	145	131	119	106	99
721	575	488	437	415	343	317	325	253	222	232
23	27	16	20	30	28	23	33	27	29	34
22	28	12	9	18	20	20	25	23	21	28
45	55	28	29	48	48	43	58	50	50	62
79	74	61	58	61	58	42	61	30	29	36
49	52	50	51	40	36	38	35	34	17	32
128	126	111	109	101	94	80	96	64	46	68
156	117	104	109	99	72	77	61	49	30	34
87	99	96	82	74	62	65	43	34	44	30
243	216	200	191	173	134	142	104	83	74	64
34	14	11	8	7	7	2	3	2	3	5
22	11	11	4	4	5	6	2	2	2	1
56	25	22	12	11	12	8	5	4	5	6
26	6	9	1	....	....	....	....	....	1	....
24	6	5	3	....	1	1	....	....	....	....
50	12	14	4	....	1	1	....	....	1	....
40	35	26	16	7	2	6	4	5	2	4
26	25	14	15	7	5	2	3	2	1	....
66	60	40	31	14	7	8	7	7	3	4
2	1	....	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....
3	1	....	....	....	....	....	....	....	....	....
7	....	....	....	....	....	....	....	....	....	....
6	2	....	....	....	....	....	....	....	....	....
13	2	....	....	....	....	....	....	....	....	....
68	46	43	37	39	31	22	32	21	22	20
49	32	30	24	29	21	13	23	24	21	8
117	78	73	61	68	52	35	55	45	43	28

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average*

CITIES AND VILLAGES WITH POPULATIONS OF 7,500 OR MORE	Estimated population, all ages, July 1, 1920, and average population for first year period 1915–1919		Births			
			Live Births		Stillbirths	
			Number	Rate per 1,000 total population	Number	Rate per 1,000 living births
TOTAL FOR STATE (Exc. N. Y. City)	1920	4,786,728	102,604	21.4	3,948	38.5
	Prev. 5 yrs.	4,613,410	102,113	22.1	3,893	38.1
Total Urban	1920	2,560,450	61,430	24.0	2,464	40.1
	Prev. 5 yrs.	2,428,830	59,901	24.7	2,363	39.4
Total Rural	1920	2,180,414	41,142	18.9	1,482	36.0
	Prev. 5 yrs.	2,184,580	42,212	19.3	1,530	36.2
Cities with populations of 175,000 and over	1920	806,056	20,049	24.9	800	39.9
	Prev. 5 yrs.	760,399	19,926	26.2	769	38.6
Buffalo	1920	508,699	13,317	26.2	553	41.5
	Prev. 5 yrs.	483,121	13,168	27.3	513	39.0
Rochester	1920	297,357	6,732	22.6	247	36.7
	Prev. 5 yrs.	277,278	6,758	24.4	256	37.9
Cities 50,000-175,000	1920	759,484	17,906	23.6	703	39.2
	Prev. 5 yrs.	717,311	17,655	24.6	702	39.8
Albany	1920	114,018	2,294	20.1	74	32.3
	Prev. 5 yrs.	109,973	2,232	20.3	83	37.2
Binghamton	1920	64,920	1,677	25.8	52	31.0
	Prev. 5 yrs.	59,393	1,494	25.2	62	41.5
Niagara Falls	1920	51,806	1,550	29.9	60	38.7
	Prev. 5 yrs.	45,529	1,525	33.5	55	36.1
Schenectady	1920	89,542	1,968	22.0	69	35.1
	Prev. 5 yrs.	84,62J	2,168	25.6	81	37.4
Syracuse	1920	172,839	4,191	24.2	193	46.1
	Prev. 5 yrs.	162,217	3,990	24.6	180	45.0
Troy	1920	71,766	1,385	19.3	74	53.4
	Prev. 5 yrs.	73,249	1,399	19.1	60	42.9
Utica	1920	93,368	2,442	26.2	94	38.5
	Prev. 5 yrs.	87,391	2,445	28.0	99	40.5
Yonkers	1920	101,225	2,399	23.7	87	36.3
	Prev. 5 yrs.	94,930	2,402	25.3	82	34.1

N.B.—Total for State (exclusive of New York City) includes population, births, and death figures and rates for 1920 (except those for Lackawanna) exclude State Institutions; while 1920, there were only 32 births and nine deaths under one year of age in Institutional Districts

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

INFANT MORTALITY

Total deaths under 1 year of age		PRINCIPAL CAUSES OF DEATH							
		Communicable diseases (1 to 14 inc.)		Respiratory diseases (28-29 and 86-98 inc.)		Gastrointestinal diseases (103-104 inc.)		Premature birth (151 A)	
Number	Rate per 1,000 living births	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
8,986	87.6	549	5.4	1,215	11.8	1,885	18.4	2,221	21.6
9,848	96.4	592	5.8	1,553	15.2	2,226	21.8	2,187	21.4
5,780	94.1	343	5.6	803	13.1	1,287	21.0	1,416	23.1
6,239	104.2	354	5.9	999	16.7	1,531	25.6	1,350	22.5
3,197	77.7	205	5.0	412	10.0	594	14.4	805	19.6
3,607	85.4	238	5.6	555	13.1	695	16.4	836	19.8
1,936	96.6	96	4.8	243	12.1	521	26.0	481	24.0
2,041	102.4	95	4.8	321	16.1	599	30.1	453	22.7
1,369	102.8	74	5.6	170	12.8	390	29.3	303	22.8
1,473	111.9	64	4.9	232	17.6	457	34.7	302	22.9
567	84.2	22	3.3	73	10.8	131	19.5	178	26.4
568	84.0	31	4.6	89	13.2	142	21.0	151	22.3
1,636	91.4	80	4.5	238	13.3	349	19.5	420	23.5
1,852	104.9	104	5.9	312	17.7	445	25.1	381	21.6
178	77.6	6	2.6	21	9.2	19	8.3	56	24.4
231	103.5	14	6.3	39	17.5	37	16.6	47	21.1
152	90.6	11	6.6	25	14.9	36	15.5	35	20.9
169	113.1	13	8.7	21	14.1	43	28.8	36	24.1
145	93.5	9	5.8	16	10.3	35	22.6	43	27.7
181	118.7	10	6.6	29	19.0	61	40.0	36	23.6
168	85.4	9	4.6	20	10.2	39	19.8	40	20.3
197	90.9	10	4.6	22	10.1	48	22.1	50	23.1
437	104.3	18	4.3	66	15.7	117	27.9	113	27.0
408	102.3	24	6.0	63	15.8	104	26.1	88	22.1
142	102.5	7	5.1	19	13.7	20	14.4	34	24.5
174	124.4	9	6.4	41	29.3	29	20.7	36	25.7
202	82.7	7	2.9	33	13.5	43	17.6	53	21.7
267	109.2	15	6.1	59	24.1	54	22.1	44	18.0
212	88.4	13	5.4	38	15.8	50	20.8	46	19.2
225	93.7	9	3.7	37	15.4	68	28.3	44	18.3

in the State Institutions for 1920 and for the average for the previous five years. All other all other figures and rates for *the five year average* include State Institutions. However, in outside of Lackawanna.

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

CITIES AND VILLAGES WITH POPULATIONS OF 7,500 OR MORE	INFANT — PRINCIPAL CAUSES OF DEATH —(*Concluded*) — Congenital debility and malformations, injuries at birth, etc. (150, 151B, 152, 153)		All other causes	
	Number	Infant mortality	Number	Infant mortality
Total for State (Exc. N. Y. City)	2,091 2,148	20.4 21.0	1,025 1,141	10.0 11.2
Total Urban	1,273 1,266	20.7 21.1	658 739	10.7 12.2
Total Rural	814 881	19.8 20.9	367 402	8.9 9.5
Cities with populations of 175,000 and over	389 339	19.4 17.0	206 233	10.3 11.7
Buffalo	288 244	21.6 18.5	144 174	10.8 13.2
Rochester	101 95	15.0 14.1	62 59	9.2 8.7
Cities 50,000–175,000	358 386	20.0 21.9	191 224	10.7 12.7
Albany	51 60	22.2 26.9	25 34	10.9 15.2
Binghamton	41 38	24.4 25.4	14 17	8.3 11.4
Niagara Falls	31 28	20.0 18.4	11 18	7.1 11.8
Schenectady	37 44	18.8 20.2	23 23	11.7 10.6
Syracuse	73 80	17.4 20.1	50 49	11.9 12.2
Troy	41 38	29.6 27.2	21 21	15.2 15.0
Utica	42 59	17.2 24.1	24 36	9.8 14.7
Yonkers	42 40	17.5 16.7	23 26	9.6 10.8

N.B.— Total for State (exclusive of New York City) includes population, births, and deaths ures and rates for 1920 (except those for Lackawanna) exclude State Institutions, while all there were only 32 births and nine deaths under one year of age in Institutional Districts out

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

MORTALITY — (*Concluded*)

AGE AT DEATH									
Under 1 day		1-6 days inclusive		1 week and under 1 month		1 month and under 3 months		3 months and under 1 year	
Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
1,918	18.7	*1,452	14.2	*1,288	12.6	*1,296	12.6	*3,032	29.6
1,981	19.4	1,475	14.4	1,342	13.1	1,521	14.9	3,529	34.6
1,169	19.0	924	15.0	826	13.4	840	13.7	2,021	32.9
1,181	19.7	910	15.2	829	13.8	955	15.9	2,365	39.5
749	18.2	526	12.8	460	11.2	452	11.0	1.010	24.5
800	19.0	565	13.4	513	12.2	566	13.4	1,164	27.6
416	20.7	283	14.1	280	14.0	267	13.3	690	34.4
379	19.0	286	14.4	275	13.8	296	14.9	804	40.3
288	21.6	180	13.5	196	14.7	198	14.9	507	38.1
266	20.2	192	14.6	196	14.9	224	17.0	595	45.2
128	19.0	103	15.3	84	12.5	69	10.2	183	27.2
113	16.7	94	13.9	69	11.7	72	10.7	209	30.9
303	16.9	295	16.5	217	12.1	228	12.7	593	33.1
328	18.6	261	14.8	248	14.0	287	16.3	728	41.2
36	15.7	44	19.2	21	9.2	25	10.9	52	22.7
48	21.5	34	15.2	25	11.2	36	16.1	89	39.9
33	19.7	19	11.3	21	12.5	22	13.1	57	34.0
33	22.1	22	14.7	24	16.1	24	16.1	66	44.2
26	16.8	27	17.4	17	11.0	19	12.3	56	36.1
30	19.7	22	14.4	24	15.7	26	17.0	79	51.8
29	14.7	30	15.2	25	12.7	31	15.8	53	26.9
39	18.0	34	15.7	29	13.4	27	12.5	68	31.4
76	18.1	67	16.0	61	14.6	58	13.8	175	41.8
69	17.3	56	14.0	62	15.5	72	18.0	150	37.6
34	24.5	24	17.3	14	10.1	24	17.3	46	33.2
31	22.2	26	18.6	19	13.6	28	20.0	70	50.0
38	15.6	36	14.7	32	13.1	23	9.4	73	29.9
41	16.8	38	15.5	35	14.3	39	16.[illegible]	113	46.2
31	12.9	48	20.0	26	10.8	26	10.8	81	33.8
37	15.4	30	12.5	30	12.5	36	15.0	92	38.3

in the State Institutions for 1920 and for the average for the previous five years. All other fig-
other figures and rates for *the five year average* include State Institutions. However, in 1920,
side of Lackawanna.

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

CITIES AND VILLAGES WITH POPULATIONS OF 7,500 OR MORE	Estimated population, all ages, July 1, 1920, and average population for five year period 1915–1919		Births			
			Live births		Stillbirths	
			Number	Rate per 1,000 total population	Number	Rate per 1,000 living births
Cities, 20,000–50,000	1920	513,826	11,539	22.5	468	40.6
	Prev. 5 yrs.	491,461	11,238	22.9	446	39.7
Amsterdam	1920	33,640	835	24.8	29	34.7
	Prev. 5 yrs.	32,943	941	28.6	28	29.8
Auburn	1920	35,057	764	21.8	26	34.0
	Prev. 5 yrs.	34,464	799	23.2	35	43.8
Cohoes	1920	22,899	422	18.4	24	56.9
	Prev. 5 yrs.	23,431	541	23.1	20	37.0
Elmira	1920	44,953	1,168	26.0	47	40.2
	Prev. 5 yrs.	42,295	1,020	24.1	47	46.1
Gloversville	1920	22,149	443	20.0	16	36.1
	Prev. 5 yrs.	21,706	436	20.1	19	43.6
Jamestown	1920	39,309	813	20.7	29	35.7
	Prev. 5 yrs.	36,955	816	22.1	29	35.5
Kingston	1920	26,728	496	18.6	20	40.3
	Prev. 5 yrs.	26,487	476	18.0	20	42.0
Lockport	1920	21,480	417	19.4	14	33.6
	Prev. 5 yrs.	20,448	377	18.4	18	47.7
Mount Vernon	1920	43,334	956	22.1	34	35.6
	Prev. 5 yrs.	39,686	891	22.5	33	37.0
Newburgh	1920	30,498	675	22.1	29	43.0
	Prev. 5 yrs.	29,706	582	19.6	19	32.6
New Rochelle	1920	36,591	673	18.4	37	55.0
	Prev. 5 yrs.	34,321	701	20.4	30	42.8
Olean	1920	20,803	544	26.2	23	42.3
	Prev. 5 yrs.	19,022	525	27.6	22	41.9
Oswego	1920	23,639	565	23.9	16	28.3
	Prev. 5 yrs.	23,560	522	22.2	21	40.2
Poughkeepsie	1920	35,364	813	23.0	31	38.1
	Prev. 5 yrs.	33,181	769	23.2	22	28.6
Rome	1920	24,629	691	28.1	35	50.7
	Prev. 5 yrs.	23,088	692	30.0	33	47.7
Watertown	1920	31,519	787	25.0	44	55.9
	Prev. 5 yrs.	30,112	691	22.9	29	42.0
White Plains	1920	21,234	477	22.5	14	29.4
	Prev. 5 yrs.	20,016	460	23.0	21	45.7

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

INFANT MORTALITY

Total deaths under 1 year of age		PRINCIPAL CAUSES OF DEATH: Communicable diseases (1 to 14 inc.)		Respiratory diseases (28-29 and 86-98 inc.)		Gastrointestinal diseases (103-104 inc.)		Premature birth (151 A)	
Number	Rate per 1,000 living births	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
1,014	87.9	86	7.5	140	12.1	164	14.2	264	22.9
1,075	95.7	63	5.6	175	15.6	211	18.8	253	22.5
72	86.2	3	3.6	10	12.0	14	16.8	17	20.4
94	99.9	5	5.3	14	14.9	24	25.5	18	19.1
81	106.0	12	15.7	11	14.4	13	17.0	22	28.8
80	100.1	5	6.3	11	13.8	20	25.0	17	21.3
44	104.8	4	9.5	5	11.8	14	33.2	8	19.0
70	129.4	4	7.4	15	27.7	21	38.8	13	24.0
84	71.9	5	4.3	12	10.3	8	6.8	26	22.3
93	91.2	4	3.9	16	15.7	15	14.7	23	22.5
39	88.0	7	15.8	1	2.3	6	13.5	10	22.6
45	103.2	2	4.6	7	16.1	7	16.1	12	27.5
70	86.1	6	7.4	12	14 8	12	14.8	13	16.0
65	79.7	4	4.9	11	13.5	7	8.6	17	20.8
40	80.6	4	8.1	4	8.1	10	20.2	10	20.2
48	100.8	3	6.3	5	10.5	7	14.7	15	31.5
43	103.1	3	7.2	7	16.8	9	21.6	12	28.8
35	92.8	2	5.3	5	13.3	8	21.2	7	18.6
78	81.6	10	10.5	14	14.6	9	9.4	22	23.0
64	71.8	4	4.5	11	12.3	12	13.5	16	18.0
62	91.9	3	4.4	9	13.3	11	16.3	13	19.3
59	101.4	2	3.4	8	13.7	14	24.1	15	25.8
44	65.4	2	3.0	5	7.4	4	5.9	19	28.2
62	88.4	4	5.7	10	14.3	9	12.8	16	22.8
47	86.4	8	14.7	8	14.7	4	7.4	12	22.1
45	85.7	2	3.8	9	17.1	5	9.5	15	28.6
42	74.3	1	1.8	5	8.8	7	12.4	12	21.2
57	109.2	4	7.7	8	15.3	13	24.9	11	21.1
78	95.9	4	4.9	9	11.1	11	13.5	21	25.8
77	100.1	5	6.5	15	19.5	13	16.9	20	26.0
71	102.7	6	8.7	12	17.4	18	26.0	13	18.8
67	96.8	5	7.2	15	21.7	17	24.6	9	13.0
88	111.8	7	8.9	12	15.2	13	16.5	23	29.2
83	120.1	7	10.1	11	15.9	14	20.3	22	31.8
31	65.0	1	2.1	4	8.4	1	2.1	11	23.1
33	71.7	2	4.3	6	13.0	5	10.9	7	15.2

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

CITIES AND VILLAGES WITH POPULATIONS OF 7,500 OR MORE	INFANT — PRINCIPAL CAUSES OF DEATH —(*Concluded*) — Congenital debility and malformations, injuries at birth, etc. (150, 151B, 152, 153)		All other causes	
	Number	Infant mortality	Number	Infant mortality
Cities 20,000–50,000	242 255	21.0 22.7	118 117	10.2 10.4
Amsterdam	25 22	29.9 23.4	3 11	3.6 11.7
Auburn	18 19	23.6 23.8	5 9	6.5 11.3
Cohoes	7 12	16.6 22.2	6 4	14.2 7.4
Elmira	24 22	20.5 21.6	9 13	7.7 12.7
Gloversville	9 11	20.3 25.2	6 5	13.5 11.5
Jamestown	18 20	22.1 24.5	9 6	11.1 7.4
Kingston	10 11	20.2 23.1	2 6	4.0 12.6
Lockport	8 10	19.2 26.5	4 4	9.6 10.6
Mount Vernon	11 15	11.5 16.8	12 6	12.6 6.7
Newburgh	16 12	23.7 20.6	10 7	14.8 12.0
New Rochelle	9 14	13.4 20.0	5 9	7.4 12.8
Olean	10 10	18.4 19.0	5 4	9.2 7.6
Oswego	13 17	23.0 32.6	4 5	7.1 9.6
Poughkeepsie	18 17	22.1 22.1	15 8	18.5 10.4
Rome	16 15	23.2 21.7	6 7	8.7 10.1
Watertown	20 20	25.4 28.9	13 9	16.5 13.0
White Plains	10 9	21.0 19.6	4 4	8.4 8.7

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

MORTALITY — (*Concluded*)

AGE AT DEATH									
Under 1 day		1-6 days inclusive		1 week and under 1 month		1 month and under 3 months		3 months and under 1 year	
Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
220	19.1	181	15.7	149	12.9	133	11.5	331	28.7
221	19.7	184	16.4	148	13.2	151	13.4	371	33.0
15	18.0	16	19.2	11	13.2	8	9.6	22	26.3
20	21.3	15	15.9	11	11.7	13	13.8	35	37.2
19	24.9	12	15.7	9	11.8	9	11.8	32	41.9
11	13.8	17	21.3	13	16.3	11	13.8	28	35.0
8	19.0	5	11.8	2	4.7	9	21.3	20	47.4
11	20.3	9	16.6	12	22.2	11	20.3	28	51.8
26	22.3	15	12.8	14	12.0	9	7.7	20	17.1
21	20.6	17	16.7	14	13.7	12	11.8	29	28.4
12	27.1	2	4.5	6	13.5	4	9.0	15	33.9
10	22.9	9	20.6	6	13.8	7	16.1	13	29.8
14	17.2	14	17.2	12	14.8	7	8.6	23	28.3
15	18.4	14	17.2	10	12.3	7	8.6	20	24.5
10	20.2	7	14.1	5	10.1	5	10.1	13	26.2
13	27.3	9	18.9	7	14.7	4	8.4	15	31.5
7	16.8	12	28.8	4	9.6	7	16.8	13	31.2
8	21.2	5	13.3	5	13.3	5	13.3	12	31.8
14	14.6	12	12.6	15	15.7	13	13.6	24	25.1
13	14.6	13	14.6	8	9.0	7	7.9	23	25.8
10	14.8	15	22.2	9	13.3	9	13.3	19	28.1
12	20.6	9	15.5	8	13.7	8	13.7	21	36.1
8	11.9	15	22.3	4	5.9	5	7.4	12	17.8
12	17.1	10	14.3	9	12.8	7	10.0	24	34.2
6	11.0	9	16.5	6	11.0	9	16.5	17	31.2
12	22.9	10	19.0	5	9.5	7	13.3	10	19.0
10	17.7	7	12.4	7	12.4	6	10.6	12	21.2
13	24.9	7	13.4	7	13.4	7	13.4	23	44.1
16	19.7	14	17.2	13	16.0	7	8.6	28	34.4
15	19.5	11	14.3	11	14.3	12	15.6	28	36.4
14	20.3	6	8.7	15	21.7	10	14.5	26	37.6
9	13.0	10	14.5	8	11.6	13	18.8	28	40.5
16	20.3	15	19.1	15	19.1	14	17.8	28	35.6
18	26.0	17	24.6	9	13.0	13	18.8	25	36.2
15	31.4	5	10.5	2	4.2	2	4.2	7	14.7
8	17.4	5	10.9	6	13.0	5	10.9	10	21.7

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

CITIES AND VILLAGES WITH POPULATIONS OF 7,500 OR MORE		Estimated population, all ages, July 1, 1920, and average population for five year period 1915–1919	Births: Live Births: Number	Births: Live Births: Rate per 1,000 total population	Births: Stillbirths: Number	Births: Stillbirths: Rate per 1,000 living births
Cities and villages 10,000–20,000	1920.......	405,877	9,905	24.4	404	40.8
	Prev. 5 yrs..	389,920	9,447	24.2	378	40.0
Batavia....................	1920.......	13,640	348	25.5	16	46.0
	Prev. 5 yrs..	13,045	332	25.4	13	39.2
Beacon....................	1920.......	10,099	206	20.4	5	24.3
	Prev. 5 yrs..	10,026	216	21.5	9	41.7
Corning....................	1920.......	15,928	427	26.8	13	30.4
	Prev. 5 yrs..	15,282	340	22.2	13	38.2
Cortland....................	1920.......	13,386	290	21.7	19	65.5
	Prev. 5 yrs..	12,833	288	22.4	15	52.1
Dunkirk....................	1920.......	19,445	567	29.2	19	33.5
	Prev. 5 yrs..	18,791	568	30.2	16	28.2
Fulton....................	1920.......	13,175	316	24.0	15	47.5
	Prev. 5 yrs..	12,383	305	24.6	15	49.2
Geneva....................	1920.......	14,761	378	25.6	15	39.7
	Prev. 5 yrs..	14,081	356	25.3	18	50.6
Glens Falls....................	1920.......	16,710	401	24.0	21	52.3
	Prev. 5 yrs..	16,279	318	19.5	14	44.0
Herkimer....................	1920.......	10,604	278	26.2	12	43.2
	Prev. 5 yrs..	9,698	283	29.2	9	31.8
Hornell....................	1920.......	15,097	295	19.5	9	30.5
	Prev. 5 yrs..	14,662	293	20.0	11	37.5
Hudson....................	1920.......	11,404	316	27.7	11	34.8
	Prev. 5 yrs..	11,310	330	29.2	13	39.4
Ilion....................	1920.......	10,353	187	18.1	5	26.7
	Prev. 5 yrs..	9,247	207	22.4	6	29.0
Ithaca....................	1920.......	17,117	350	20.4	12	34.3
	Prev. 5 yrs..	16,437	344	20.9	13	37.8
Johnstown....................	1920.......	10,932	184	16.8	3	16.3
	Prev. 5 yrs..	10,789	174	16.1	7	40.2
Lackawanna§....................	1920.......	17,861	872	48.8	17	19.5
	Prev. 5 yrs..	16,853	826	49.0	28	33.9
Little Falls....................	1920.......	13,068	352	26.9	9	25.6
	Prev. 5 yrs..	12,834	426	33.2	12	28.2
Middletown....................	1920.......	16,346	310	19.0	26	83.9
	Prev. 5 yrs..	15,512	288	18.6	14	48.6

§ Includes Our Lady of Victory Infant Home.

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life

INFANT MORTALITY

Total deaths under 1 year of age		PRINCIPAL CAUSES OF DEATH							
		Communicable diseases (1 to 14 inc.)		Respiratory diseases (28-29 and 86-98 inc.)		Gastrointestinal diseases (103-104 inc.)		Premature birth (151 A)	
Number	Rate per 1,000 living births	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
1,029	103.9	66	6.7	166	16.8	221	22.3	215	21.7
1,121	118.7	83	8.8	164	17.4	249	26.4	226	23.6
33	94.8	3	8.6	7	20.1	3	8.6	11	31.6
35	105.4	2	6.0	4	12.0	7	21.1	10	30.1
24	116.5	2	9.7	4	19.5	1	4.9	4	19.5
18	83.3	......	......	3	13.9	3	13.9	6	27.8
27	63.2	1	2.3	3	7.0	3	7.0	8	18.7
34	100.0	2	5.9	4	11.8	5	14.7	10	29.4
19	65.5	......	......	2	6.9	2	6.9	10	34.5
29	100.7	2	6.9	3	10.4	6	20.8	7	24.3
51	89.9	5	8.8	5	8.8	9	15.9	9	15.9
56	98.6	5	8.8	7	12.3	12	21.1	13	22.9
28	88.6	5	15.8	5	15.8	8	25.3	5	15.8
35	114.8	4	13.1	3	9.8	8	26.2	8	26.2
47	124.3	5	13.2	3	7.9	15	39.7	10	26.5
32	89.9	2	5.6	6	16.9	5	14.0	7	19.7
33	82.2	1	2.5	5	12.5	4	10.0	6	15.0
30	94.3	1	3.1	5	15.7	5	15.7	9	28.3
24	86.3	......	......	9	32.4	2	7.2	2	7.2
24	84.8	1	3.5	5	17.7	5	17.7	5	17.7
18	61.0	......	......	......	......	1	3.4	5	16.9
21	71.7	1	3.4	4	13.7	2	6.8	4	13.7
22	69.6	......	......	3	9.5	5	15.8	11	34.8
37	112.1	2	6.1	5	15.2	9	27.3	9	27.3
13	69.5	......	......	......	......	5	26.7	6	32.1
15	72.5	......	......	2	9.7	2	9.7	4	19.3
33	94.3	5	14.3	2	5.7	5	14.3	12	34.3
24	69.8	2	5.8	1	2.9	3	8.7	6	17.4
16	87.0	1	5.4	5	27.2	3	16.3	3	16.3
16	92.0	1	5.7	1	5.7	4	23.0	3	17.2
238	272.9	18	20.6	46	52.8	72	82.6	19	21.8
259	313.6	26	31.5	42	50.8	85	102.9	20	24.2
30	85.2	......	......	4	11.4	9	25.6	10	28.4
44	103.3	2	4.7	6	14.1	11	25.8	9	21.1
25	80.6	3	9.7	1	3.2	2	6.5	8	25.8
22	76.4	1	3.5	3	10.4	3	10.4	6	20.8

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

CITIES AND VILLAGES WITH POPULATIONS OF 7,500 OR MORE	INFANT			
	PRINCIPAL CAUSES OF DEATH —(*Concluded*)			
	Congenital debility and malformations, injuries at birth, etc. (150, 151B, 152, 153)		All other causes	
	Number	Infant mortality	Number	Infant mortality
Cities and villages 10,000–20,000	245 249	24.7 26.4	116 150	11.7 15.9
Batavia	4 8	11.5 24.1	5 3	14.4 9.0
Beacon	7 5	34.0 23.1	6	29.1 ....
Corning	11 9	25.8 26.5	1 4	2.3 11.3
Cortland	4 7	13.8 24.3	1 4	3.4 13.9
Dunkirk	19 15	33.5 26.4	4 4	7.1 7.0
Fulton	2 7	6.3 23.0	3 5	9.5 16.4
Geneva	8 8	21.2 22.5	6 4	15.9 11.2
Glens Falls	14 6	34.9 18.9	3 4	7.5 12.6
Herkimer	9 6	32.4 21.2	2 3	7.2 10.6
Hornell	8 7	27.1 23.9	4 3	13.6 10.2
Hudson	2 10	6.3 30.3	1 2	3.2 6.1
Ilion	2 6	10.7 29.0	 1	.... 4.8
Ithaca	6 10	17.1 29.1	3 2	8.6 5.8
Johnstown	1 4	5.4 23.0	3 3	16.3 17.2
Lackawanna§	43 33	49.3 40.0	40 52	45.9 63.0
Little Falls	6 10	17.0 23.5	1 5	2.8 11.7
Middletown	5 5	16.1 17.4	6 3	19.4 10.4

§ Includes Our Lady of

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

MORTALITY — (*Concluded*)

AGE AT DEATH									
Under 1 day		1-6 days inclusive		1 week and under 1 month		1 month and under 3 months		3 months and under 1 year	
Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
190	19.2	143	14.4	156	15.7	188	19.0	352	35.5
219	23.2	151	16.0	138	14.6	199	21.1	414	43.8
8	23.0	4	11.5	3	8.6	6	17.2	12	34.5
8	24.1	6	18.1	4	12.0	6	18.1	11	33.1
4	19.5	5	24.3	2	9.7	6	29.1	7	34.0
6	27.8	4	18.5	2	9.3	2	9.3	4	18.5
9	21.1	4	9.4	4	9.4	4	9.4	6	14.1
10	29.4	5	14.7	4	11.8	5	14.7	9	26.5
5	17.2	4	13.8	2	6.9	4	13.8	4	13.8
8	27.8	3	10.4	4	13.9	5	17.4	9	31.2
13	22.9	9	15.9	6	10.6	7	12.3	16	28.2
16	28.2	9	15.8	5	8.8	8	14.1	18	31.7
3	9.5	4	12.7	4	12.7	6	19.0	11	34.8
8	26.2	6	19.7	4	13.1	4	13.1	13	42.6
9	23.8	5	13.2	3	7.9	5	13.2	25	66.0
8	22.5	4	11.2	4	11.2	4	11.2	12	33.0
9	22.4	7	17.5	4	10.0	6	15.0	7	17.5
5	15.7	4	12.6	6	18.9	4	12.6	11	34.6
4	14.4	1	3.6	5	18.0	6	21.6	8	28.8
6	21.2	3	10.6	2	7.1	3	10.6	10	35.3
6	20.3	......	......	6	20.3	1	3.4	5	16.9
5	17.1	5	17.1	2	6.8	2	6.8	7	23.9
9	28.5	2	6.3	5	15.8	1	3.2	5	15.8
8	24.2	7	21.2	5	15.2	6	18.2	12	36.4
6	32.1	1	5.3	1	5.3	3	16.0	2	10.7
3	14.5	4	19.3	3	14.5	1	4.8	4	19.3
3	8.6	11	31.4	5	14.3	6	17.1	8	22.9
6	17.4	6	17.4	3	8.7	4	11.6	6	17.4
3	16.3	1	5.4	1	5.4	1	5.4	10	54.2
2	11.5	3	17.2	3	17.2	3	17.2	5	28.7
18	20.6	12	13.8	35	40.1	75	86.0	98	112.4
20	24.2	10	12.1	32	38.7	75	90.8	122	147.7
5	14.2	7	19.9	5	14.2	1	2.8	12	34.1
6	14.1	10	23.5	5	11.7	6	14.1	17	39.9
5	16.1	5	16.1	3	9.7	2	6.5	10	32.3
5	17.4	3	10.4	3	10.4	3	10.4	7	24.3

Victory Infant Home.

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

CITIES AND VILLAGES WITH POPULATIONS OF 7,500 OR MORE	Estimated population, all ages, July 1, 1920, and average population for first year period 1915–1919		Births			
			Live births		Stillbirths	
			Number	Rate per 1,000 total population	Number	Rate per 1,000 living births
North Tonawanda	1920	15,663	414	26.4	16	38.6
	Prev. 5 yrs.	14,574	426	29.2	15	35.2
Ogdensburg	1920	12,266	327	26.7	16	48.9
	Prev. 5 yrs.	12,776	335	26.2	15	44.8
Oneida	1920	10,655	296	27.8	13	43.9
	Prev. 5 yrs.	9,968	215	21.6	9	41.9
Oneonta	1920	11,690	254	21.7	14	55.1
	Prev. 5 yrs.	11,044	225	20.4	11	48.9
Ossining	1920	9,645	228	23.6	9	39.5
	Prev. 5 yrs.	9,664	209	21.6	8	38.3
Peekskill	1920	15,900	335	22.1	15	44.8
	Prev. 5 yrs.	15,708	301	19.2	14	46.5
Plattsburg	1920	10,897	289	26.5	18	62.3
	Prev. 5 yrs.	10,968	244	22.2	15	61.5
Port Chester	1920	16,767	545	32.5	20	36.7
	Prev. 5 yrs.	15,604	517	33.1	19	36.8
Port Jervis	1920	10,202	249	24.4	7	28.1
	Prev. 5 yrs.	10,015	197	19.7	11	55.8
Rensselaer	1920	10,829	101	9.3	10	99.1
	Prev. 5 yrs.	10,794	139	12.9	6	43.2
Saratoga Springs	1920	13,154	273	20.8	21	76.9
	Prev. 5 yrs.	13,317	261	19.6	13	49.8
Tonawanda	1920	10,159	222	21.9	9	40.5
	Prev. 5 yrs.	9,610	198	20.6	5	25.3
Watervliet	1920	16,124	295	18.3	9	30.5
	Prev. 5 yrs.	15,816	284	18.0	11	38.7

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

INFANT MORTALITY

Total deaths under 1 year of age		PRINCIPAL CAUSES OF DEATH: Communicable diseases (1 to 14 inc.)		Respiratory diseases (28-29 and 86-98 inc.)		Gastrointestinal diseases (103-104 inc.)		Premature birth (151 A)	
Number	Rate per 1,000 living births	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
38	91.8	4	9.7	11	26.6	7	16.9	6	14.5
47	110.3	4	9.4	8	18.8	14	32.9	7	16.4
62	189.6	3	9.2	10	30.6	16	48.9	8	24.5
51	152.2	2	6.0	6	17.9	8	23.9	11	32.8
22	74.3	......	......	3	10.1	5	16.9	8	27.0
19	88.4	1	4.7	2	9.3	4	18.6	6	27.9
13	51.2	......	......	3	11.8	1	3.9	4	15.7
21	93.3	1	4.4	2	8.9	3	13.4	7	31.1
13	57.0	1	4.4	6	26.3	1	4.4	2	8.8
16	76.6	2	9.6	2	9.6	2	9.6	2	9.6
30	89.6	......	......	4	11.9	7	20.9	9	26.9
27	89.7	1	3.3	4	13.3	7	23.3	7	23.3
25	86.5	2	6.9	1	3.5	6	20.8	7	24.2
35	143.4	2	8.2	4	16.4	5	20.5	11	45.1
36	66.1	2	3.7	5	9.2	3	5.5	9	16.5
44	85.1	5	9.7	7	13.5	7	13.5	11	21.3
23	92.4	......	......	4	16.1	7	28.1	5	20.1
27	137.1	2	10.2	3	15.2	5	25.4	8	40.6
10	99.1	......	......	3	29.7	4	39.6	......	......
16	115.1	1	7.2	3	21.6	2	14.4	2	14.4
22	80.6	2	7.3	6	22.0	......	......	6	22.0
26	99.6	2	7.7	5	19.2	3	11.5	6	23.0
25	112.6	1	4.5	3	13.5	9	40.5	3	13.5
18	90.9	1	5.1	2	10.1	4	20.2	6	30.3
29	98.3	2	6.8	3	10.2	6	20.3	9	30.5
37	130.3	3	10.6	11	38.7	6	21.1	7	24.6

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

CITIES AND VILLAGES WITH POPULATIONS OF 7,500 OR MORE	INFANT — PRINCIPAL CAUSES OF DEATH —(*Concluded*) — Congenital debility and malformations, injuries at birth, etc. (150, 151B, 152, 153)		All other causes	
	Number	Infant mortality	Number	Infant mortality
North Tonawanda	8	19.3	2	4.8
	11	25.8	4	9.4
Ogdensburg	22	67.3	3	9.2
	19	56.7	4	11.9
Oneida	5	16.9	1	3.4
	5	23.6	2	9.3
Oneonta	5	19.7	....	....
	5	22.2	3	13.3
Ossining	2	8.8	1	4.4
	5	23.9	2	9.6
Peekskill	8	23.9	2	6.0
	5	16.6	3	10.0
Plattsburg	6	20.8	3	10.4
	9	36.9	4	16.4
Port Chester	14	25.7	3	5.5
	8	15.5	7	13.5
Port Jervis	7	28.1	....	....
	6	30.5	3	15.2
Rensselaer	3	29.7	....	....
	5	36.0	3	21.6
Saratoga Springs	7	25.6	1	3.7
	7	26.8	2	7.7
Tonawanda	3	13.5	6	27.0
	3	15.2	3	15.2
Watervliet	4	13.6	5	16.9
	7	24.6	3	10.6

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

MORTALITY — (*Concluded*)

AGE AT DEATH									
Under 1 day		1-6 days inclusive		1 week and under 1 month		1 month and under 3 months		3 months and under 1 year	
Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
8	19.3	5	12.1	4	9.7	7	16.9	14	33.8
8	18.8	6	14.1	5	11.7	8	18.8	20	46.9
12	36.7	12	36.7	13	39.8	7	21.4	18	55.0
18	53.7	10	29.9	5	14.9	5	14.9	14	41.8
5	16.9	4	13.5	8	27.0	2	6.8	3	10.0
4	18.6	4	18.6	3	14.0	3	14.0	6	27.9
2	7.9	4	15.7	2	7.9	2	7.9	3	11.8
6	26.7	3	13.3	2	8.9	4	17.8	6	26.7
1	4.4	2	8.8	2	8.8	1	4.4	7	30.7
4	19.1	3	14.4	2	9.6	2	9.6	5	23.9
9	26.9	4	11.9	5	14.9	5	14.9	7	20.9
6	19.9	5	16.6	3	10.0	3	10.0	10	33.2
4	13.8	7	24.2	5	17.3	4	13.8	5	17.3
9	36.9	6	24.6	4	16.4	5	20.5	10	41.0
11	20.2	10	18.3	6	11.0	1	1.8	8	14.7
8	15.5	7	13.5	7	13.5	4	7.7	18	34.8
6	24.1	1	4.0	6	24.1	3	12.0	7	28.1
7	35.5	4	20.3	3	15.2	5	25.4	5	40.6
....	......	1	9.9	....	......	6	59.5	3	29.7
3	21.6	2	14.4	1	7.2	3	21.6	7	50.4
4	14.7	5	18.3	3	11.0	2	7.3	8	29.3
6	23.0	4	15.3	3	11.5	6	23.0	6	23.0
4	18.0	2	9.0	3	13.5	7	31.5	9	40.5
5	25.3	2	10.1	2	10.1	4	20.2	6	30.3
5	16.9	4	13.6	5	16.9	1	3.4	14	47.5
7	24.6	3	10.6	5	17.6	5	17.6	18	63.4

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infan!* *in certain areas of the State:* 1920 *and* 1915–1919 *average*

CITIES AND VILLAGES WITH POPULATIONS OF 7,500 OR MORE	Estimated population, all ages, July 1, 1920, and average population for first year period 1915–1919		BIRTHS			
			Live births		Stillbirths	
			Number	Rate per 1,000 total population	Number	Rate per 1,000 living births
Cities and villages 7,500–10,000	**1920.......**	**77,207**	**2,031**	**26.3**	**89**	**43.8**
	Prev. 5 yrs..	**69,779**	**1,530**	**21.9**	**63**	**41.2**
Canandaigua................	1920.......	7,363	216	29.3	8	37.0
	Prev. 5 yrs..	7,320	203	27.7	8	39.4
Endicott....................	1920.......	9,865	312	31.6	6	19.2
	Prev. 5 yrs..	7,647	260	33.9	7	26.9
Freeport....................	1920.......	8,792	140	15.9	3	21.4
	Prev. 5 yrs..	7,630	131	17.2	6	45.8
Glen Cove*..................	1920.......	8,757	233	26.6	9	38 6
	Prev. 5 yrs..	8,196	......	......	......	....
Johnson City................	1920.......	8,834	325	36.8	22	67.7
	Prev. 5 yrs..	7,347	200	27.2	7	35.0
Malone......................	1920.......	7,612	213	28.0	11	51.6
	Prev. 5 yrs..	7,276	161	22.1	6	37.3
Mechanicville................	1920.......	8,245	194	23.5	10	51.5
	Prev. 5 yrs..	7,771	216	27.8	11	50.9
Norwich.....................	1920.......	8,311	179	21.5	11	61.5
	Prev. 5 yrs..	8,050	173	21.5	9	52.0
Salamanca...................	1920.......	9,428	219	23.2	9	41.1
	Prev. 5 yrs..	8,515	186	21.8	9	48.4

* Not a city until 1918 — previous to that year its births and deaths were included with those

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

INFANT MORTALITY

Total deaths under 1 year of age		PRINCIPAL CAUSES OF DEATH							
		Communicable diseases (1 to 14 inc.)		Respiratory diseases (28-29 and 86-98 inc.)		Gastrointestinal diseases (103-104 inc.)		Premature birth (151 A)	
Number	Rate per 1,000 living births	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
165	81.2	15	7.4	16	7.9	32	15.8	36	17.7
144	94.1	9	5.9	22	14.4	27	17.6	37	24.2
8	37.0	......	......	1	4.6	1	4.6	1	4.6
15	73.9	1	4.9	2	9.9	2	9.9	4	19.7
30	96.2	6	19.2	2	6.4	6	19.2	7	22.4
27	103.8	2	7.7	4	15.4	8	30.8	5	19.2
12	85.7	1	7.1	3	21.4	2	14.3	2	14.3
12	91.6	1	7.6	2	15.3	3	22.9	2	15.3
20	85.8	2	8.6	4	17.2	4	17.2	2	8.6
......	......	......	......	......	......	......	......	......	......
27	83.1	1	3.1	......	......	5	15.4	11	33.8
16	80.0	1	5.0	3	15.0	3	15.0	4	20.0
29	136.2	2	9.4	3	14.1	8	37.6	5	23.5
19	118.0	3	18.6	3	18.6	3	18.6	5	31.1
12	61.9	1	5.2	1	5.2	2	10.3	2	10.3
19	88.0	1	4.6	4	18.5	4	18.5	4	18.5
9	50.3	......	......	1	5.6	2	11.2	2	11.2
17	98.3	1	5.8	3	17.3	2	11.6	6	34.7
18	82.2	2	9.1	1	4.6	2	9.1	4	18.3
18	96.8	......	......	3	16.1	3	16.1	6	32.3

of Oyster Bay — therefore the average for the five years preceding 1920 not attainable.

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

CITIES AND VILLAGES WITH POPULATIONS OF 7,500 OR MORE	INFANT — PRINCIPAL CAUSES OF DEATH — (*Concluded*) — Congenital debility and malformations, injuries at birth, etc. (150, 151B, 152, 153): Number	Infant mortality	All other causes: Number	Infant mortality
Cities and villages 7,500–10,000	39 36	19.2 23.5	27 13	13.3 8.5
Canandaigua	3 4	13.9 19.7	2 2	9.3 9.9
Endicott	6 7	19.2 26.9	3 2	9.6 7.7
Freeport	2 2	14.3 15.3	2 2	14.3 15.3
Glen Cove*	4	17.2	4	17.2 ......
Johnson City	6 4	18.5 20.0	4 1	12.3 5.0
Malone	6 4	28.2 24.8	5 2	23.5 12.4
Mechanicville	4 5	20.6 23.1	2 2	10.3 9.3
Norwich	 4	...... 23.1	4 2	22.3 11.6
Salamanca	8 5	36.5 26.9	1	4.6 ....

* Not a city until 1918 — previous to that year its births and deaths were included with those

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life

MORTALITY — (*Concluded*)

AGE AT DEATH									
Under 1 day		1-6 days inclusive		1 week and under 1 month		1 month and under 3 months		3 months and under 1 year	
Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
40	19.7	22	10.8	24	11.8	24	11.8	55	27.1
33	21.6	26	17.0	19	12.4	21	13.7	45	29.4
4	18.5	2	9.3	....	......	....	......	2	9.3
4	19.7	3	14.8	1	4.9	3	14.8	4	19.7
8	25.6	1	3.2	5	16.0	3	9.6	13	41.7
4	15.4	5	19.2	3	11.5	4	15.4	11	42.3
2	14.3	2	14.3	2	14.3	3	21.4	3	21.4
2	15.3	2	15.3	2	15.3	2	15.3	4	30.5
....	......	5	21.5	5	21.5	3	12.9	7	30.0
....	......	......	......	......	......	......	......	....	....
9	27.7	3	9.2	4	12.3	2	6.2	9	27.7
3	15.0	3	15.0	2	10.0	3	15.0	6	30.0
4	18.8	4	18.8	2	9.4	9	42.3	10	46.9
4	24.8	3	18.6	2	12.4	4	24.8	7	43.5
5	25.8	....	......	1	5.2	3	15.5	3	15.5
6	27.8	3	13.9	3	13.9	2	9.3	6	27.8
1	5.6	2	11.2	2	11.2	....	......	4	22.3
	..	3	17.3	3	17.3	2	11.6	5	28.9
	32.0	3	13.7	3	13.7	1	4.6	4	18.3
6	32.3	4	21.5	2	10.8	2	10.8	4	21.5

of Oyster Bay — therefore the average for the five years preceding 1920 not attainable.

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

RURAL PARTS OF COUNTIES	Estimated population, all ages, July 1, 1920, and average population for five year period 1915–1919		Births: Live births: Number	Births: Live births: Rate per 1,000 total population	Births: Stillbirths: Number	Births: Stillbirths: Rate per 1,000 living births
Total — Rural districts	1920......	2,180,414	41,142	18.9	1,482	36.0
	Prev. 5 yrs.	2,184,580	42,212	19.3	1,530	36.2
Albany	1920......	33,705	532	15.8	22	41.4
	Prev. 5 yrs.	33,683	593	17.6	20	33.7
Allegany	1920......	36,607	647	17.7	30	46.4
	Prev. 5 yrs.	38,019	688	18.1	28	40.7
Broome	1920......	28,958	553	19.1	29	52.4
	Prev. 5 yrs.	27,554	501	18.2	16	31.9
Cattaraugus	1920......	41,370	790	19.1	28	35.4
	Prev. 5 yrs.	42,394	770	18.2	30	39.0
Cayuga	1920......	28,854	427	14.8	16	37.5
	Prev. 5 yrs.	29,907	474	15.8	14	29.5
Chautauqua	1920......	57,120	1,064	18.6	38	35.7
	Prev. 5 yrs.	56,970	1,029	18.1	34	33.0
Chemung	1920......	20,633	294	14.2	9	30.6
	Prev. 5 yrs.	19,708	339	17.2	14	41.3
Chenango	1920......	26,488	441	16.6	15	34.0
	Prev. 5 yrs.	26,919	454	16.9	19	41.9
Clinton	1920......	31,225	856	27.4	39	45.6
	Prev. 5 yrs.	32,412	842	26.0	31	36.8
Columbia	1920......	26,925	415	15.4	14	33.7
	Prev. 5 yrs.	28,487	477	16.7	17	35.6
Cortland	1920......	16,258	326	20.1	9	27.6
	Prev. 5 yrs.	16,695	285	17.1	11	38.6
Delaware	1920......	42,630	813	19.1	17	20.9
	Prev. 5 yrs.	43,495	863	19.8	28	32.4
Dutchess	1920......	41,977	672	16.0	17	25.3
	Prev. 5 yrs.	43,203	799	18.5	26	32.5
Erie	1920......	99,489	2,046	20.6	74	41.1
	Prev. 5 yrs.	94,154	1,955	20.8	61	31.2
Essex	1920......	31,465	745	23.7	27	36.2
	Prev. 5 yrs.	32,000	737	23.0	27	36.6
Franklin	1920......	35,817	883	24.7	31	35.1
	Prev. 5 yrs.	36,826	867	23.5	35	40.4
Fulton	1920......	11,866	219	18.5	7	32.0
	Prev. 5 yrs.	12,331	217	17.6	8	36.9
Genesee	1920......	24,354	430	17.7	7	16.3
	Prev. 5 yrs.	24,839	482	19.4	14	29.0
Greene	1920......	25,569	436	17.1	13	29.8
	Prev. 5 yrs.	26,934	459	17.0	15	32.7
Hamilton	1920......	3,949	79	20.0	3	38.0
	Prev. 5 yrs.	4,074	84	20.6	4	47.6

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life

INFANT MORTALITY

Total deaths under 1 year of age		Principal causes of death: Communicable diseases (1 to 14 inc.)		Respiratory diseases (28–29 and 86–98 inc.)		Gastrointestinal diseases (103–104 inc.)		Premature birth (151 A)	
Number	Rate per 1,000 living births	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
3,197	77.7	205	5.0	412	10.0	594	14.4	805	19.6
3,607	85.4	238	5.6	555	13.1	695	16.4	836	19.8
54	101.5	2	3.8	6	11.3	9	16.9	9	16.9
55	92.7	6	10.1	12	20.2	10	16.9	8	13.5
54	83.5	5	7.7	3	4.6	9	13.9	15	23.2
48	69.8	3	4.4	7	10.2	7	10.2	10	14.5
45	81.4	9	16.3	2	3.6	12	21.7	9	16.3
43	85.8	2	4.0	5	10.0	9	18.0	9	18.0
64	81.0	6	7.6	2	2.5	5	6.3	23	29.1
62	80.5	2	2.6	8	10.4	10	13.0	21	27.3
31	72.6	2	4.7	1	2.3	9	21.1	9	21.1
35	73.8	2	4.2	4	8.4	6	12.7	8	16.9
64	60.2	3	2.8	6	5.6	17	16.0	20	18.8
75	72.9	5	4.9	9	8.7	13	12.6	22	21.4
25	85.0	......	......	2	6.8	3	10.2	8	27.2
31	91.4	2	5.9	5	14.7	4	11.8	8	23.6
20	45.4	1	2.3	......	......	4	9.1	10	22.7
30	66.1	3	6.6	4	8.8	3	6.6	10	22.0
96	112.1	5	5.8	8	9.3	27	31.5	28	32.7
97	115.2	9	10.7	18	21.4	20	23.8	21	24.9
29	69.9	3	7.2	7	16.9	3	7.2	5	12.0
43	90.1	3	6.3	6	12.6	9	18.9	8	16.8
16	49.1	2	6.1	......	......	2	6.1	5	15.3
22	77.2	2	7.0	2	7.0	4	14.0	6	21.1
52	64.0	4	4.9	6	7.4	9	11.1	12	14.8
67	77.6	5	5.8	9	10.4	8	9.3	16	18.5
59	87.8	5	7.4	11	16.4	5	7.4	12	17.9
73	91.4	5	6.3	13	16.3	10	12.5	19	23.8
165	80.6	3	1.5	22	10.8	50	24.4	38	18.6
180	92.1	12	6.1	29	14.8	51	26.1	40	20.5
73	98.0	6	8.1	13	17.4	13	17.4	15	20.1
78	105.8	5	6.8	9	12.2	20	27.1	17	23.1
98	111.0	5	5.7	13	14.7	27	30.6	21	23.8
92	106.1	8	9.2	15	17.3	18	20.8	19	21.9
17	77.6	3	13.7	......	......	4	18.3	3	13.7
17	78.3	2	9.2	5	23.0	2	9.2	3	13.8
17	39.5	......	......	1	2.3	3	7.0	8	18.6
31	64.3	3	6.2	7	14.5	5	10.4	8	16.6
34	78.0	4	9.2	3	6.9	2	4.6	8	18.3
41	89.3	4	8.7	5	10.9	8	17.4	11	24.0
5	63.3	......	......	2	25.3	......	......	2	25.3
5	59.5	......	......	1	11.9	......	......	1	11.9

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

RURAL PARTS OF COUNTIES	INFANT — PRINCIPAL CAUSES OF DEATH — (*Concluded*) — Congenital debility and malformations, injuries at birth, etc. (150, 151B, 152, 153) — Number	Infant mortality	All other causes — Number	Infant mortality
Total — Rural districts	814 881	19.8 20.9	367 402	8.9 9.5
Albany	18 11	33.8 18.5	10 7	18.8 11.8
Allegany	14 16	21.6 23.3	8 6	12.4 8.7
Broome	8 12	14.5 24.0	5 6	9.0 12.0
Cattaraugus	25 12	31.6 15.6	3 10	3.8 13.0
Cayuga	7 11	16.4 23.2	3 4	7.0 8.4
Chautauqua	12 18	11.3 17.5	6 7	5.6 6.8
Chemung	8 7	27.2 20.6	4 5	13.6 14.7
Chenango	3 8	6.8 17.6	2 3	4.5 6.6
Clinton	20 24	23.4 28.5	8 6	9.3 7.1
Columbia	6 10	14.5 21.0	5 7	12.0 14.7
Cortland	5 7	15.3 24.6	2 1	6.1 3.5
Delaware	15 21	18.5 24.3	6 7	7.4 8.1
Dutchess	18 17	26.8 21.3	8 8	11.9 10.0
Erie	38 33	18.6 16.9	14 14	6.8 7.2
Essex	17 21	22.8 28.5	9 7	12.1 9.5
Franklin	24 22	27.2 25.4	8 10	9.1 11.5
Fulton	5 3	22.8 13.8	2 2	9.1 9.2
Genesee	3 5	7.0 10.4	2 3	4.7 6.2
Greene	5 8	11.5 17.4	12 6	27.5 13.1
Hamilton	1 2	12.7 23.8	 1	.... 11.9

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

MORTALITY — (*Concluded*)

AGE AT DEATH									
Under 1 day		1–6 days inclusive		1 week and under 1 month		1 month and under 3 months		3 months and under 1 year	
Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
749	18.2	526	12.8	460	11.2	452	11.0	1,010	24.5
800	19.0	565	13.4	513	12.2	566	13.4	1,164	27.6
7	13.2	9	16.9	12	22.6	4	7.5	22	41.4
8	13.5	7	11.8	8	13.5	10	16.9	22	37.1
14	21.6	10	15.5	10	15.5	6	9.3	14	21.6
12	17.4	11	16.0	5	7.3	8	11.6	12	72.4
5	9.0	6	10.8	8	14.5	8	14.5	18	32.5
10	20.0	7	14.0	5	10.0	7	14.0	14	27.9
24	30.4	13	16.5	4	5.1	10	12.7	13	16.5
17	22.1	10	13.0	9	11.7	8	10.4	17	22.1
7	16.4	7	16.4	2	4.7	9	21.1	6	14.1
10	21.1	5	10.5	7	14.8	6	12.7	7	14.8
18	16.9	13	12.2	8	7.5	9	8.5	16	15.0
20	19.4	12	11.7	9	8.7	12	11.7	22	21.4
3	10.2	6	20.4	7	23.8	5	17.0	4	13.6
6	17.7	5	14.7	6	17.7	6	17.7	8	23.6
6	13.6	7	15.9	2	4.5	2	4.5	3	6.8
8	17.6	3	6.6	5	11.0	4	8.8	9	19.8
24	28.0	16	18.7	14	16.4	12	14.0	30	35.0
20	23.8	16	19.0	16	19.0	15	17.8	30	35.6
5	12.0	5	12.0	3	7.2	4	9.6	12	28.9
9	18.9	6	12.6	5	10.5	7	14.7	17	35.6
2	6.1	1	3.1	7	21.5	3	9.2	3	9.2
6	21.1	3	10.5	4	14.0	3	10.5	7	24.6
10	12.3	14	17.2	2	2.5	12	14.8	14	17.2
13	15.1	13	15.1	11	12.7	13	15.1	17	19.7
10	14.9	10	14.9	15	22.3	6	8.9	18	26.8
21	26.3	11	13.8	9	11.3	9	11.3	22	27.5
40	19.6	23	11.2	26	12.7	20	9.8	56	27.4
38	19.4	23	11.8	23	11.8	23	11.8	72	36.8
22	29.5	8	10.7	9	12.1	8	10.7	26	34.9
21	28.5	8	10.9	11	14.9	14	19.0	24	32.6
14	15.9	17	19.3	12	13.6	21	23.8	34	38.5
17	19.6	15	17.3	16	18.5	14	16.1	30	34.6
5	22.8	3	13.7	3	13.7	2	9.1	4	18.3
4	18.4	2	9.2	1	4.6	4	18.4	6	27.6
4	9.3	4	9.3	4	9.3	3	7.0	2	4.7
8	16.6	5	10.4	3	6.2	5	10.4	10	20.7
6	13.8	9	20.6	3	6.9	5	11.5	11	25.2
9	19.6	8	17.4	3	6.5	5	10.9	15	32.7
2	25.3	....	......	1	12.7	1	12.7	1	12.7
1	11.9	2	23.8	1	11.9	1	11.9	1	11.9

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated 1,000 total population, stillbirth and death rates per 1,000 living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

RURAL PARTS OF COUNTIES	Estimated population, all ages, July 1, 1920, and average population for five year period 1915–1919		Births: Live births: Number	Births: Live births: Rate per 1,000 total population	Births: Stillbirths: Number	Births: Stillbirths: Rate per 1,000 living births
Herkimer	1920......	31,380	619	19.7	18	29.1
	Prev. 5 yrs.	30;967	661	21.3	22	33.3
Jefferson	1920......	50,827	935	18.4	33	35.3
	Prev. 5 yrs.	51,657	948	18.4	37	39.0
Lewis	1920......	23,645	489	20.7	21	42.9
	Prev. 5 yrs.	23,999	476	19.8	21	44.1
Livingston	1920......	35,362	682	19.3	28	41.1
	Prev. 5 yrs.	35,750	780	21.8	24	30.8
Madison	1920......	28,893	532	18.4	20	37.6
	Prev. 5 yrs.	29,503	557	18.9	20	35.9
Monroe	1920......	56,463	956	16.9	31	32.4
	Prev. 5 yrs.	55,387	1,291	23.3	35	27.1
Montgomery	1920......	24,306	436	17.9	12	27.5
	Prev. 5 yrs.	24,892	414	16.6	16	38.6
Nassau	1920......	110,744	2,415	21.8	79	32.7
	Prev. 5 yrs.*	99,430	2.281	22.9	87	38.1
Niagara	1920......	31,129	547	17.6	11	20.1
	Prev. 5 yrs.	31,287	586	18.7	21	35.8
Oneida	1920......	62,496	1,192	19.1	46	38.6
	Prev. 5 yrs.	61,539	1.190	19.3	43	36.1
Onondaga	1920......	70,093	1,227	17.5	52	42.4
	Prev. 5 yrs.	68,023	1,296	19.1	43	33.2
Ontario	1920......	30,547	500	16.4	24	48.0
	Prev. 5 yrs.	31,157	531	17.0	17	32.0
Orange	1920......	60,762	1,131	18.6	44	38.9
	Prev. 5 yrs.	61,513	1,177	19.1	44	27.4
Orleans	1920......	28,445	547	19.2	24	43.9
	Prev. 5 yrs.	29,490	625	21.2	24	38.4
Oswego	1920......	34,199	666	19.5	20	30.0
	Prev. 5 yrs.	35,262	658	18.7	22	33.4
Otsego	1920......	34,458	564	16.4	23	40.8
	Prev. 5 yrs.	35,418	554	15.6	23	41.5
Putnam	1920......	10,603	230	21.7	5	21.7
	Prev. 5 yrs.	11,797	216	18.3	5	23.1
Rensselaer	1920......	30,063	461	15.3	16	34.7
	Prev. 5 yrs.	31,441	497	15.8	13	26.2
Rockland	1920......	44,459	879	19.8	35	39.8
	Prev. 5 yrs.	45,137	888	19.7	32	36.0
St. Lawrence	1920......	73,535	1,640	22.3	90	54.9
	Prev. 5 yrs.	73,399	1,571	21.4	84	53.5
Saratoga	1920......	38,533	726	18.8	28	38.6
	Prev. 5 yrs.	39,426	736	18.7	28	38.0

* Includes City of Glen Cove for the years, 1915–16–17 not then a city and so, not separately reportable from the town of Oyster Bay.

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

INFANT MORTALITY

TOTAL DEATHS UNDER 1 YEAR OF AGE		PRINCIPAL CAUSES OF DEATH							
		Communicable diseases (1 to 14 inc.)		Respiratory diseases (28–29 and 86–98 inc.)		Gastrointestinal diseases (103–104 inc.)		Premature birth (151 A)	
Number	Rate per 1,000 living births	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
49	79.2	3	4.8	2	3.2	13	21.0	13	21.0
63	95.3	2	3.0	11	16.6	17	25.7	15	22.7
73	78.1	5	5.3	8	8.6	13	13.9	25	26.7
86	90.7	4	4.2	12	12.7	13	13.7	21	22.2
36	73.6	2	4.1	4	8.2	5	10.2	6	12.3
38	79.8	4	8.4	4	8.4	5	10.5	8	16.8
45	66.0	2	2.9	8	11.7	7	10.3	10	14.7
64	82.1	5	6.4	10	12.8	10	12.8	16	20.5
39	73.3	2	3.8	....	......	5	9.4	16	30.1
47	84.4	2	3.4	5	9.0	7	12.6	13	23.3
58	60.7	4	4.2	9	9.4	7	7.3	18	18.8
101	78.2	6	4.6	14	10.8	24	18.6	25	19.4
35	80.3	2	4.6	3	6.9	4	9.2	11	25.2
39	94.2	3	7.2	7	16.9	8	19.3	8	19.3
163	67.5	5	2.1	32	13.3	37	15.3	36	14.9
211	92.5	13	5.7	35	15.3	41	18.0	42	18.4
46	84.1	7	12.8	5	9.6	12	21.9	9	16.5
40	68.3	3	5.1	5	8.5	8	13.7	10	17.1
95	79.7	6	5.0	13	10.9	16	13.4	15	12.6
105	88.2	8	6.7	17	14.3	25	21.0	20	16.8
95	77.4	5	4.1	19	15.5	22	17.9	13	10.6
120	92.6	5	3.9	20	15.4	32	24.7	25	19.3
36	72.0	6	12.0	2	4.0	4	8.0	11	22.0
42	79.1	3	5.6	5	9.4	6	11.3	13	24.5
102	90.2	8	7.1	20	17.7	19	16.8	21	18.6
114	96.9	8	6.8	18	15.3	23	19.5	24	20.4
35	64.0	1	1.8	4	7.3	5	9.1	12	21.9
39	62.4	1	1.6	6	9.6	7	11.2	11	17.6
51	76.6	2	3.0	8	12.0	8	12.0	10	15.0
59	89.7	4	6.1	7	10.6	8	12.2	17	25.8
36	63.8	1	1.8	1	1.8	2	3.5	17	30.1
41	74.0	2	3.6	5	9.0	6	10.8	13	23.5
9	39.1	....	......	....	......	3	13.0	....	....
19	88.0	1	4.6	2	9.3	3	13.9	6	27.8
28	60.7	....	......	6	13.0	5	10.8	7	15.2
43	86.5	3	6.0	6	12.1	6	12.1	10	20.1
76	86.5	7	8.0	8	9.1	15	17.1	16	18.2
79	89.0	6	6.8	15	16.9	16	18.0	13	14.6
177	107.9	14	8.5	22	13.4	39	23.8	52	31.7
166	105.7	7	4.6	29	18.5	33	21.0	38	24.2
58	79.9	5	6.9	12	16.5	10	13.8	13	17.9
69	93.7	3	4.1	15	20.4	14	19.0	16	21.7

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

RURAL PARTS OF COUNTIES	INFANT			
	PRINCIPAL CAUSES OF DEATH — (*Concluded*)			
	Congenital debility and malformations, injuries at birth, etc. (150, 151B, 152, 153)		All other causes	
	Number	Infant mortality	Number	Infant mortality
Herkimer	13 13	21.0 19.7	5 5	8.1 7.6
Jefferson	15 23	16.0 24.3	7 13	7.5 13.7
Lewis	16 12	32.7 25.2	3 6	6.1 12.6
Livingston	13 14	19.1 17.9	5 8	7.3 10.3
Madison	14 14	26.3 25.1	2 5	3.8 9.0
Monroe	13 23	13.6 17.8	7 9	7.8 7.0
Montgomery	9 8	20.6 19.3	6 4	13.8 9.7
Nassau	34 52	14.1 22.8	19 29	7.9 12.7
Niagara	9 12	16.5 20.5	4 3	7.3 5.1
Oneida	32 22	26.8 18.5	13 12	10.9 10.1
Onondaga	26 24	21.2 18.5	10 14	8.1 10.8
Ontario	9 10	18.0 18.8	4 5	8.0 9.4
Orange	24 27	21.2 22.9	10 13	8.8 11.0
Orleans	8 10	14.6 16.0	5 4	9.1 6.4
Oswego	16 17	24.0 25.8	7 5	10. 7.6
Otsego	11 9	19.5 16.2	4 5	7.1 9.0
Putnam	5 4	21.7 18.5	1 2	4.3 9.3
Rensselaer	8 15	17.4 30.2	2 3	4.3 6.0
Rockland	23 20	26.2 22.5	7 9	8.0 10.1
St. Lawrence	36 38	22.0 24.2	14 20	8.5 12.7
Saratoga	12 16	16.5 21.7	6 6	8.3 8.2

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

MORTALITY — (*Concluded*)

AGE AT DEATH									
Under 1 day		1–6 days inclusive		1 week and under 1 month		1 month and under 3 months		3 months and under 1 year	
Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
14	22.6	11	17.8	5	8.1	4	6.5	15	24.2
12	18.2	8	12.1	8	12.1	11	16.6	24	36.3
18	19.3	10	10.7	12	12.8	8	8.6	25	26.7
19	20.0	12	12.7	13	13.7	16	16.9	27	28.5
14	28.6	8	16.4	4	8.2	3	6.1	7	14.3
9	18.9	7	14.7	4	8.4	5	10.5	13	27.3
14	20.5	6	8.8	6	8.8	4	5.9	15	22.0
17	21.8	8	10.3	8	10.3	9	11.5	22	28.2
13	24.4	7	13.2	5	9.4	9	16.9	5	9.4
12	21.5	10	18.0	6	10.8	9	16.2	10	18.0
20	20.9	9	9.4	5	5.2	10	10.5	14	14.6
23	17.8	15	11.6	13	10.1	16	12.4	35	27.1
9	20.6	3	6.9	5	11.5	5	11.5	13	29.8
6	14.5	7	16.9	5	12.1	7	16.9	14	33.8
28	11.6	20	8.3	23	9.5	32	13.3	60	24.8
42	18.4	29	12.7	28	12.3	32	14.0	81	35.5
12	21.9	5	9.1	6	11.0	8	14.6	15	27.4
10	17.1	6	10.2	6	10.2	6	10.2	12	20.5
24	20.1	19	15.9	8	6.7	11	9.2	33	27.7
20	16.8	14	11.8	18	15.1	15	12.6	39	32.8
14	11.4	14	11.4	13	10.6	15	12.2	39	31.8
24	18.5	14	10.8	15	11.6	20	15.4	47	36.3
7	14.0	7	14.0	5	10.0	7	14.0	10	20.0
13	24.5	6	11.3	7	13.2	7	13.2	9	16.9
20	17.7	13	11.5	14	12.4	15	13.3	40	35.4
25	22.1	17	14.4	14	11.9	16	13.6	41	34.8
11	20.1	4	7.3	6	11.0	5	9.1	9	16.5
11	17.6	7	11.2	5	8.0	6	9.6	10	16.0
11	16.5	10	15.0	8	12.0	2	3.0	20	30.0
13	19.8	11	16.7	9	13.7	11	16.7	15	22.8
15	26.6	5	8.9	6	10.6	5	8.9	5	8.9
13	23.5	8	14.4	5	9.0	7	12.6	9	16.2
2	8.7	1	4.3	....	......	1	4.3	5	21.7
4	18.5	3	13.9	2	9.3	3	13.9	6	27.8
5	10.8	5	10.8	5	10.8	3	6.5	10	21.7
8	16.1	10	20.1	5	10.1	9	18.1	11	22.1
20	22.8	9	10.2	8	9.1	16	18.2	23	26.2
16	18.0	9	10.1	12	15.5	15	16.9	28	31.5
35	21.3	32	19.5	24	14.6	17	10.4	69	42.1
36	22.9	22	14.0	28	17.8	25	15.9	55	35.0
15	20.7	11	15.2	3	4.1	13	17.9	16	22.0
15	20.4	13	17.7	7	9.5	12	16.3	22	29.9

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

RURAL PARTS OF COUNTIES	Estimated population, all ages, July 1, 1920, and average population for five year period 1915–1919		Births			
			Live Births		Stillbirths	
			Number	Rate per 1,000 population	Number	Rate per 1,000 living births
Schenectady	1920	20,909	364	17.4	9	24.7
	Prev. 5 yrs.	19,298	354	18.3	10	28.2
Schoharie	1920	21,172	377	17.8	19	50.4
	Prev. 5 yrs.	21,960	371	16.9	14	37.7
Schuyler	1920	13,052	256	19.6	7	27.3
	Prev. 5 yrs.	13,331	260	19.5	11	42.3
Seneca	1920	22,051	414	18.8	15	36.2
	Prev. 5 yrs.	22,806	437	19.2	19	43.5
Steuben	1920	48,705	961	19.7	44	45.8
	Prev. 5 yrs.	50,277	941	18.7	32	34.0
Suffolk	1920	100,378	2,134	21.3	76	35.6
	Prev. 5 yrs.	96,962	1,962	20.2	68	34.7
Sullivan	1920	33,130	539	16.3	18	33.4
	Prev. 5 yrs.	33,329	567	17.0	22	38.8
Tioga	1920	24,139	416	17.2	11	26.4
	Prev. 5 yrs.	24,576	391	15.9	12	30.7
Tompkins	1920	18,252	334	18.3	8	24.0
	Prev. 5 yrs.	18,426	317	17.2	10	31.5
Ulster	1920	47,175	786	16.7	31	39.4
	Prev. 5 yrs.	52,543	874	16.6	35	40.0
Warren	1920	14,935	279	18.7	9	32.3
	Prev. 5 yrs.	15,536	288	18.5	13	45.1
Washington	1920	44,173	810	18.3	32	39.5
	Prev. 5 yrs.	45,179	865	19.1	36	41.6
Wayne	1920	47,770	862	18.0	24	27.8
	Prev. 5 yrs.	48,245	955	19.8	38	39.8
Westchester	1920	101,601	1,760	17.3	55	31.2
	Prev. 5 yrs.	97,166	1,875	19.3	64	34.1
Wyoming	1920	30,283	554	18.3	13	23.5
	Prev. 5 yrs.	30,717	611	19.9	22	36.0
Yates	1920	16,538	254	15.4	6	23.6
	Prev. 5 yrs.	17,156	291	17.0	13	24.7

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

INFANT MORTALITY

TOTAL DEATHS UNDER 1 YEAR OF AGE		PRINCIPAL CAUSES OF DEATH							
		Communicable diseases (1 to 14 inc.)		Respiratory diseases (28–29 and 86–98 inc.)		Gastrointestinal diseases (103–104 inc.)		Premature birth (151 A)	
Number	Rate per 1,000 living births	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
25	68.7	....	......	4	11.0	9	24.7	2	5.5
31	87.6	2	5.6	5	14.1	6	16.9	7	19.8
26	69.0	1	2.7	1	2.7	3	8.0	11	29.2
32	86.3	4	10.8	3	8.1	4	10.8	7	18.9
14	54.7	....	......	....	......	....	....	6	23.4
17	65.4	2	7.7	3	11.5	2	7.7	3	11.5
33	79.7	....	......	4	9.7	6	14.5	10	24.2
35	80.1	3	6.9	4	9.2	8	18.3	8	18.3
65	67.6	7	7.3	6	6.2	13	13.5	16	16.6
72	76.5	6	6.4	8	8.5	11	11.7	20	21.3
164	76.9	10	4.7	24	11.2	28	13.1	43	20.1
143	72.9	8	4.1	21	10.7	26	13.3	34	17.3
31	57.5	....	......	7	13.0	4	7.4	8	14.8
38	67.0	1	1.8	6	10.6	7	12.3	9	15.9
37	88.9	3	7.2	4	9.6	6	14.4	10	24.0
28	71.6	2	5.1	3	7.7	5	12.8	5	12.8
20	59.9	2	6.0	1	3.0	7	21.0	3	9.0
24	75.7	3	9.5	3	9.5	3	9.5	5	15.8
70	89.1	5	6.4	15	19.1	10	12.7	14	17.8
78	89.2	6	6.9	12	13.7	15	17.2	15	17.2
26	93.2	3	10.8	1	3.6	2	7.2	9	32.3
23	79.0	2	6.9	3	10.4	3	10.4	7	24.3
61	75.3	4	4.9	13	16.0	6	7.4	14	17.3
80	92.5	7	8.1	12	13.9	16	18.5	21	24.3
64	74.2	3	3.5	8	9.3	9	10.4	17	19.7
71	74.3	5	5.2	12	12.6	9	9.4	17	17.8
140	79.5	7	4.0	22	12.5	21	11.9	38	21.6
161	85.9	9	4.8	28	14.9	34	18.1	32	17.1
43	77.6	5	9.0	6	10.8	3	5.4	9	16.2
44	72.0	2	3.3	7	11.5	8	13.1	11	18.0
18	70.9	....	......	2	7.9	3	11.8	4	15.7
22	75.6	....	......	3	10.3	3	10.3	7	24.1

Table VIII.— STATE OF NEW YORK (exclusive of New York City): *Estimated* 1,000 *total population, stillbirth and death rates per* 1,000 *living births, infant in certain areas of the State:* 1920 *and* 1915–1919 *average* — (Continued)

RURAL PARTS OF COUNTIES	INFANT			
	PRINCIPAL CAUSES OF DEATH — (*Concluded*)			
	Congenital debility and malformations, injuries at birth, etc. (150, 151B, 152, 153)		All other causes	
	Number	Infant mortality	Number	Infant mortality
Schenectady	6	16.5	4	11.0
	6	16.9	4	11.3
Schoharie	7	18.6	3	·8.0
	11	20.6	3	8.1
Schuyler	6	23.4	2	7.8
	6	23.1	2	7.7
Seneca	9	21.7	4	9.7
	9	20.6	4	9.2
Steuben	16	16.6	7	7.3
	20	21.3	6	6.4
Suffolk	41	19.2	18	8.4
	37	18.9	16	8.2
Sullivan	9	16.7	3	5 6
	10	17.6	5	8.8
Tioga	6	14.4	8	19.2
	10	25.6	2	5.1
Tompkins	6	18.0	1	3.0
	7	22.1	2	6.3
Ulster	16	20.4	10	12.7
	19	21.7	11	12.6
Warren	7	25.1	4	14.3
	6	20.8	2	6.9
Washington	14	17.3	10	12.3
	16	18.5	8	9.2
Wayne	19	22.0	8	9.3
	20	20.9	9	9.4
Westchester	32	18.2	20	11.4
	38	20.3	19	10.1
Wyoming	14	25.3	6	10.8
	12	19.6	4	6.5
Yates	8	31.5	1	3.9
	5	17.2	5	13.7

populations, number of births, stillbirths and deaths under one year of age, birth rate per mortality rates from important causes and for certain subdivisions of the first year of life,

MORTALITY — (*Concluded*)

AGE AT DEATH									
Under 1 day		1–6 days inclusive		1 week and under 1 month		1 month and under 3 months		3 months and under 1 year	
Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality	Number	Infant mortality
3	8.2	5	13.7	2	5.5	3	8.2	12	33.0
3	8.5	6	16.9	6	16.9	5	14.1	11	31.1
7	18.6	7	18.6	2	5.3	3	8.0	7	18.6
8	21.6	5	13.5	6	16.2	6	16.2	7	18.9
8	31.3	3	11.7	....	....	1	3.9	2	7.8
5	19.2	3	11.5	2	7.7	2	7.7	4	15.4
9	21.7	6	14.5	2	4.8	5	12.1	11	26.6
8	18.3	6	13.7	5	11.4	4	9.2	12	27.5
10	10.4	12	12.5	18	18.7	8	8.3	17	17.7
17	18.1	15	15.1	11	11.7	12	12.8	18	19.1
46	21.6	24	11.2	24	11.2	27	12.7	43	20.1
34	17.3	25	12.7	18	9.2	22	11.2	44	22.4
3	5.6	6	11.1	8	14.8	2	3.7	12	22.3
10	17.6	6	10.6	7	12.3	7	12.3	9	15.9
6	14.4	6	14.4	8	19.2	7	16.8	10	24.0
7	17.9	6	15.3	4	10.2	4	10.2	8	20.5
4	12.0	2	6.0	2	6.0	5	15.0	7	21.0
5	15.8	4	12.6	3	9.5	5	15.8	7	22.1
15	19.1	10	12.7	12	15.3	12	15.3	21	26.7
16	18.3	11	12.6	13	14.9	13	14.9	26	29.7
11	39.4	5	17.9	1	3.6	4	14.3	5	17.9
6	20.8	4	13.9	3	10.4	3	10.4	6	20.8
13	16.0	8	9.9	10	12.3	7	8.6	23	28.4
16	18.5	13	16.0	13	15.0	12	13.9	27	31.2
14	16.2	11	12.8	14	16.2	5	5.8	20	23.2
16	16.8	13	13.6	12	12.6	10	10.5	21	22.0
32	18.2	21	11.9	22	12.5	15	8.5	50	28.4
27	14.4	28	14.9	21	11.2	23	12.3	61	32.5
12	21.7	6	10.8	10	18.1	4	7.2	11	19.9
10	16.4	10	16.4	7	11.5	7	11.5	10	16.4
7	27.6	4	15.7	2	7.9	1	3.9	4	15.7
6	20.6	3	10.3	5	17.2	3	10.3	5	17.2

Table IX.— STATE OF NEW YORK (exclusive of New York City): *Deaths* (exclusive *by sex and color, and for children of white*

CAUSE OF DEATH AND SEX	Sex	Total deaths	CHILDREN						
				COUNTRY OF					
					Foreign				
			Total	United States	Total	England, Scotland Wales	Ireland	Germany	German Poland
Total deaths under 1 year of age, from all causes......	M	5,164	5,090	3,351	1,693	77	68	67	4
	F	3,822	3,758	2,467	1,253	46	60	39	1
	Total	8,986	8,848	5,818	2,946	123	128	106	5
Causes of death:									
Communicable diseases..... (1-14 inc)	M	305	300	189	110	4	4	1	...
	F	244	241	142	98	1	8	1	...
	Total	549	541	331	208	5	12	2	...
Syphilis.................... (37)	M	68	66	47	17	2	....	....	...
	F	34	32	24	7	....	....	....	...
	Total	102	98	71	24	2	....	....	...
Convulsions............... (71)	M	55	55	38	16	1	....	....	...
	F	36	35	23	12	....	....	....	...
	Total	91	90	61	28	1	....	....	...
Acute bronchitis, pneumonia and bronchopneumonia (89, 91, 92)	M	663	642	335	299	8	5	7	1
	F	475	466	255	207	8	4	8	...
	Total	1,138	1,108	590	506	16	9	15	1
Other respiratory diseases... (28, 29; 86-88, 90, 93-98 inc.)	M	44	43	27	16	....	1	1	...
	F	33	32	18	12	....	....	1	...
	Total	77	75	45	28	....	1	2	...
Gastrointestinal diseases.... (103-104)	M	1,061	1,056	630	421	17	11	22	1
	F	824	810	462	339	7	14	5	...
	Total	1,885	1,866	1,092	760	24	25	27	1
Premature birth........... (151 A)	M	1,273	1,258	920	329	20	17	12	1
	F	948	934	683	248	13	16	13	1
	Total	2,221	2,192	1,603	577	33	33	25	2
Congenital debility, malformations etc.............. (150, 151 B, 152 B, 153)	M	850	839	594	235	11	12	12	...
	F	655	646	469	171	8	11	8	...
	Total	1,505	1,485	1,063	406	19	23	20	...
Injuries at birth........... (152 A)	M	343	340	223	116	7	9	6	1
	F	243	238	169	66	6	4	....	...
	Total	586	578	392	182	13	13	6	1
External causes............ (164-186 inc.)	M	48	48	34	9	2	....	....	...
	F	39	38	19	11	....	1	1	...
	Total	87	86	53	20	2	1	1	...
All other causes...........	M	454	443	314	125	5	9	6	...
	F	291	286	203	82	3	2	2	...
	Total	745	729	517	207	8	11	8	...

of stillbirths) *from important causes and for certain subdivisions of the first year of life* *mothers by country of birth of mothers:* **1920**

OF WHITE MOTHERS														CHILDREN OF COLORED MOTHERS		
BIRTH OF MOTHER																
Country																
Italy	Russia	Russian Poland	Austria	Austrian Poland	Hungary	Poland unspecified	Total Poland	Canada (French)	Canada (other)	Total Canada	Norway, Sweden, Denmark	Other foreign countries	Country not stated	Total	Negro	American Indian
558	111	35	148	31	41	339	409	26	83	109	14	91	46	74	72	2
416	65	18	104	23	24	282	324	14	85	99	11	65	38	64	60	4
974	176	53	252	54	65	621	733	40	168	208	25	156	84	138	132	6
40	5	..	11	3	2	24	27	3	5	8	3	5	1	5	5	....
37	5	1	13	1	1	18	20	2	8	10	...	2	1	3	3	....
77	10	1	24	4	3	42	47	5	13	18	3	7	2	8	8	....
6	1	..	..	1	1	2	3	2	...	2	1	1	2	2	2	....
3	..	..	1	..	1	..	..	..	1	1	...	1	1	2	2	....
9	1	..	1	1	2	2	3	2	1	3	1	2	3	4	4	....
4	2	..	3	..	..	3	3	..	2	2	...	1	1	...	...	....
6	2	..	..	1	..	1	2	..	2	2	...	...	...	1	1	....
10	4	..	3	1	..	4	5	..	4	4	...	1	1	1	1	....
116	18	6	32	6	8	60	73	6	12	18	1	13	8	21	21	....
86	7	4	9	6	2	49	59	1	10	11	1	12	4	9	9	....
202	25	10	41	12	10	109	132	7	22	29	2	25	12	30	30	....
4	..	1	..	..	1	6	7	..	1	1	...	1	...	1	1	....
3	..	..	1	..	1	4	4	..	1	1	...	1	2	1	1	....
7	..	1	1	..	2	10	11	..	2	2	...	2	2	2	2	....
129	20	14	45	9	13	109	133	6	10	16	...	15	5	5	4	1
102	10	6	31	7	7	111	124	5	18	23	...	16	9	14	13	1
231	30	20	76	16	20	220	257	11	28	39	...	31	14	19	17	2
106	24	3	22	3	10	57	64	4	21	25	4	25	9	15	14	1
77	22	4	22	5	5	31	41	2	22	24	4	11	3	14	14	....
183	46	7	44	8	15	88	105	6	43	49	8	36	12	29	28	1
72	20	7	18	4	5	34	45	2	21	23	2	15	10	11	11	....
54	13	1	13	1	4	32	34	2	10	12	2	12	6	9	7	2
126	33	8	31	5	9	66	79	4	31	35	4	27	16	20	18	2
37	10	3	8	1	..	24	29	..	4	4	1	5	1	3	3	....
15	3	2	5	1	2	18	21	1	5	6	1	3	3	5	5	....
52	13	5	13	2	2	42	50	1	9	10	2	8	4	8	8	....
....	3	..	..	..	..	1	1	2	1	3	...	...	5	...	...	....
5	1	..	1	..	..	..	..	..	1	1	...	1	8	1	1	....
5	4	..	1	..	..	1	1	2	2	4	...	1	13	1	1	....
44	8	1	9	4	1	19	24	1	6	7	2	10	4	11	11	....
28	2	..	8	1	1	18	19	1	7	8	3	6	1	5	4	1
72	10	1	17	5	2	37	43	2	13	15	5	16	5	16	15	1

Table IX.— STATE OF NEW YORK (exclusive of New York City): *Deaths* (exclusive *by sex and color, and for children of white*

AGE AT DEATH AND SEX	Sex	Total deaths	CHILDREN						
			Total	COUNTRY OF					
				United States	Foreign				
					Total	England, Scotland Wales	Ireland	Germany	German Poland
Age at Death									
Under 1 day	M	1,112	1,098	797	290	16	17	11	1
	F	806	795	597	190	7	15	8	1
	Total	1,918	1,893	1,394	480	23	32	19	2
1-6 days	M	822	816	572	240	14	15	9	1
	F	630	619	429	182	15	11	6	...
	Total	1,452	1,435	1,001	422	29	26	15	1
7 days to 1 month	M	771	761	512	242	13	8	9	...
	F	517	510	360	147	7	8	11	...
	Total	1,288	1,271	872	389	20	16	20	...
1 and 2 months	M	755	747	501	238	16	7	16	...
	F	541	532	353	171	6	8	6	...
	Total	1,296	1,279	854	409	22	15	22	...
3, 4 and 5 months	M	762	749	461	282	8	11	15	...
	F	578	569	338	226	6	8	3	...
	Total	1,340	1,318	799	508	14	19	18	...
6, 7 and 8 months	M	559	546	295	244	6	4	5	...
	F	426	415	227	185	4	4	4	...
	Total	985	961	522	429	10	8	9	...
9, 10 and 11 months	M	383	373	213	157	4	6	2	2
	F	324	318	163	152	1	6	1	...
	Total	707	691	376	309	5	12	3	2

of stillbirths) ***from important causes and for certain subdivisions of the first year of life mothers by country of birth of mothers:*** **1920**

OF WHITE MOTHERS														CHILDREN OF COLORED MOTHERS		
BIRTH OF MOTHER																
Country																
Italy	Russia	Russian Poland	Austria	Austrian Poland	Hungary	Poland unspecified	Total Poland	Canada (French)	Canada (other)	Total Canada	Norway, Sweden Denmark	Other foreign countries	Country of birth not stated	Total	Negro	American Indian
89	16	4	21	2	7	55	62	2	20	22	4	25	11	14	13	1
60	12	4	13	4	4	31	40	3	20	23	1	7	8	11	11	....
149	28	8	34	6	11	86	102	5	40	45	5	32	19	25	24	1
75	20	6	24	1	6	41	49	2	13	15	2	11	4	6	6	....
57	11	4	14	2	2	34	40	..	13	13	2	11	8	11	10	1
132	31	10	38	3	8	75	89	2	26	28	4	22	12	17	16	1
83	21	7	18	7	4	45	59	4	11	15	2	15	7	10	10	....
35	18	2	12	4	6	29	35	..	7	7	2	6	3	7	7	....
118	39	9	25	11	10	74	94	4	18	22	4	21	10	17	17	....
66	11	1	29	3	9	51	55	5	15	20	1	8	8	8	7	1
67	5	3	16	4	6	24	31	1	13	14	2	10	8	9	8	1
133	16	4	45	7	15	75	86	6	28	34	3	18	16	17	15	2
96	13	8	28	7	5	63	78	6	10	16	2	10	6	13	13	....
71	10	1	23	3	2	65	69	4	15	19	2	13	5	9	9	....
167	23	9	51	10	7	128	147	10	25	35	4	23	11	22	22	....
88	22	3	19	10	5	55	68	5	8	13	3	11	7	13	13	....
66	7	..	13	4	3	55	59	3	9	12	1	12	8	11	9	2
154	29	3	32	14	8	110	127	8	17	25	4	23	10	24	22	2
61	8	6	14	1	5	29	38	2	6	8	...	11	3	10	10	....
60	2	4	13	2	1	44	50	3	8	11	1	6	3	6	6	....
121	10	10	27	3	6	73	88	5	14	19	1	17	6	16	16	....

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed*

[District number is obtained by prefixing county number to number before each district. e g. 101=Albany city, 150=Berne town, 120=Green Island village; cities (c) in bold face, village (v) in italics, towns in Roman type.]

See important footnote at end of table

District number	COUNTY AND DISTRICT	POPULATION		
		United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
01	**Albany county**	**186,106**	**183,330**	**173,666**
01	**Albany city**	**113,344**	**107,979**	**100,253**
02	**Cohoes city**	**22,987**	**23,433**	**24,709**
03	**Watervliet city**	**16,073**	**14,990**	**15,074**
50	Berne	1,371	1,638	1,753
51	Bethlehem	4,430	5,590	4,413
52	Coeymans	2,054	2,881	4,252
23	*Ravena village*	*2,093*	*1,700*	....
53	Colonie	10,196	9,989	8,385
(54	Green Island)*	....	....	....
20	*Green Island village*	*4,411*	*4,533*	*4,737*
55	Guilderland	2,320	2,885	2,659
21	*Altamont village*	*797*	*806*	*674*
56	Knox	975	1,101	1,007
57	New Scotland	1,856	2,374	2,301
22	*Voorheesville village*	*614*	*550*	*533*
58	Rensselaerville	1,345	1,619	1,609
59	Westerlo	1,240	1,263	1,307
02	**Allegany county**	**36,842**	**40,216**	**41,412**
50	Alfred	671	818	831
20	*Alfred village*	*598*	*677*	*759*
51	Allen	524	627	598
52	Alma	643	752	973
53	Almond	1,121	1,279	1,297
54	Amity	822	984	977
21	*Belmont village*	*1,021*	*1,031*	*1,094*
55	Andover	677	859	854
22	*Andover village*	*1,132*	*1,154*	*1,136*
56	Angelica	530	580	612
23	*Angelica village*	*972*	*1,138*	*1,056*
57	Belfast	1,279	1,477	1,773
58	Birdsall	464	564	568
59	Bolivar (29)	772	920	964
24	*Bolivar village*	*1,146*	*1,260*	*1,318*
60	Burns	563	621	770
25	*Canaseraga village*	*651*	*668*	*754*
61	Caneadea	1,060	1,124	1,223
30	*Oramel village*	*123*	*126*	*131*
62	Centerville	668	813	781
63	Clarksville	770	743	794
64	Cuba	784	731	875
26	*Cuba village*	*1,611*	*1,645*	*1,556*
65	Friendship	762	851	882
27	*Friendship village*	*1,036*	*1,199*	*1,218*
66	Genesee	911	1,061	1,105
67	Granger	590	709	708
68	Grove	602	752	740
69	Hume	1,701	1,915	1,736
70	Independence	1,028	1,177	1,202
71	New Hudson	663	762	852
72	Rushford	1,118	1,326	1,260
73	Scio	1,062	1,064	1,196
74	Ward	400	506	496
75	Wellsville	1,175	1,261	1,281
28	*Wellsville village*	*4,996*	*4,595*	*4,382*
76	West Almond	416	462	458
77	Willing	755	924	998
78	Wirt	684	681	758
29	†*Richburg village (59)*	*351*	*380*	*451*

* Coterminous with Green Island, village.

† Richburg, village, located in two towns, Bolivar and Wirt. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION: United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
03	**Broome county**	**113,610**	**90,641**	**78,809**
01	**Binghamton city**	**66,800**	**53,668**	**48,443**
50	Barker	1,003	987	948
51	Binghamton	672	731	675
52	Chenango	1,183	1,273	1,237
53	Colesville	2,311	2,525	2,415
54	Conklin	796	942	850
55	Dickinson	1,092	639	395
20	*Port Dickinson village*	*883*	*583*	*437*
56	Fenton	1,111	1,240	1,050
57	Kirkwood	899	942	852
58	Lisle	925	1,130	1,100
21	*Lisle village*	*294*	*347*	*329*
59	Maine	1,360	1,339	1,363
60	Nanticoke	444	549	536
61	Sanford	1,479	1,779	1,836
22	*Deposit village*	*1,202*	*1,026*	*1,144*
[*22**	*Deposit village (1255)*	*1,943*	*1,779*	*1,864*]
62	Triangle	793	873	856
23	*Whitney Point village*	*665*	*760*	*744*
63	Union	4,261	2,333	1,759
24	*Endicott village*	*9,500*	*5,581*	*2,408*
25	*Johnson City, village*	*8,587*	*5,400*	*3,775*
26	*Union village*	*3,303*	*1,922*	*1,544*
64	Vestal	1,910	1,688	1,618
65	Windsor	1,539	1,719	1,858
27	*Windsor village*	*598*	*665*	*637*
04	**Cattaraugus county**	**71,323**	**72,756**	**65,919**
01	**Olean city**	**20,506**	**17,925**	**14,743**
02	**Salamanca city**	**9,276**	**8,370**	**6,322**
50	Allegany	1,890	2,029	2,112
20	*Allegany village*	*1,350*	*1,327*	*1,286*
51	Ashford	1,379	1,524	1,557
52	Carrollton	559	797	495
21	*Limestone village*	*454*	*463*	*684*
53	Cold Spring	567	722	685
54	Conewango	787	560	505
22†	*East Randolph village (78)*	*544*	*582*	*593*
55	Dayton	1,057	1,770	1,710
30	*South Dayton village*	*655*	....	....
56	East Otto	915	1,062	1,093
57	Elko	220	302	246
58	Ellicottville	816	963	1,082
23	*Ellicottville village*	*950*	*881*	*985*
59	Farmersville	999	976	948
60	Franklinville	988	1,109	1,095
24	*Franklinville village*	*2,015*	*2,065*	*1,568*
61	Freedom	1,016	1,124	1,159
62	Great Valley	1,336	1,513	1,775
63	Hinsdale	972	1,090	1,125
64	Humphrey	531	625	626
65	Ischua	656	775	803
66	Leon	729	925	859
67	Little Valley	430	529	537
25	*Little Valley village*	*1,253*	*1,307*	*1,368*
68	Lyndon	567	549	603
69	Machias	1,431	1,575	1,529
70	Mansfield	717	867	912

* Deposit, village, located in two counties, Broome and Delaware. Total for entire village given in bracketed line.

† East Randolph, village, located in two towns, Conewango and Randolph. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION		
		United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	CATTARAUGUS COUNTY — (*Concluded*)			
71	Napoli	636	783	741
72	New Albion	706	876	824
26	*Cattaraugus village*	*1,347*	*1,276*	*1,165*
73	Olean	1,316	1,324	885
74	Otto	773	839	922
75	Perrysburg	879	1,123	1,004
32	*Perrysburg village*	*271*	....	....
(76	Persia)	361	‡	381
(*27*)	*Gowanda village*	*1,833*	(*1,800*	*pt. 1,349*)
[*27*†	*Gowanda village* (*1458*)	*2,673*	*2,524*	*2,012*]
77	Portville	1,558	1,690	1,613
28	*Portville village*	*606*	*765*	*758*
78	Randolph (22)	461	1,237	1,188
29	*Randolph village*	*1,310*	*1,341*	*1,298*
79	Red House	434	700	613
80	Salamanca	361	414	316
81	South Valley	356	497	487
82	Yorkshire	977	1,082	1563
31	*Delevan village*	*547*	*557*	....
	Indian Reservations	1,026	2,146	1,807
05	**Cayuga county**	**65,221**	**65,751**	**67,106**
01	**Auburn city**	**36,192**	**32,468**	**34,668**
50	Aurelius	977	1,096	1,089
20	*Cayuga village*	*300*	*373*	*348*
51	Brutus	807	990	877
21	*Weedsport village*	*1,379*	*1,448*	*1,344*
52	Cato	1,014	885	869
*22**	*Cato village* (*56*)	*404*	*390*	*377*
23	*Meridian village*	*274*	*313*	*326*
53	Conquest	1,044	1,225	1,103
54	Fleming	886	1,031	1,017
55	Genoa	1,483	1,853	1,866
56	Ira (22)	1,063	1,467	1,451
57	Ledyard	1,059	1,233	1,226
24	*Aurora village*	*416*	*396*	*493*
58	Locke	770	843	864
59	Mentz	723	876	824
25	*Port Byron village*	*1,035*	*1,115*	*1,085*
60	Montezuma	669	914	941
61	Moravia	735	846	836
26	*Moravia village*	*1,331*	*1,393*	*1,324*
62	Niles	1,076	1,254	1,209
63	Owasco	1,458	1,503	1,393
64	Scipio	1,218	1,417	1,470
65	Sempronius	575	743	756
66	Sennett	1,358	1,481	1,423
67	Springport	504	740	649
27	*Union Springs village*	*642*	*762*	*798*
68	Sterling	1,487	1,845	1,788
28	*Fairhaven village*	*552*	*624*	*571*
69	Summer Hill	539	604	613
70	Throop	958	963	960
71	Venice	1,215	1,402	1,343
72	Victory	1,078	1,258	1,208

* Cato, village, located in two towns, Cato and Ira. Total shown represents entire population of this village.

† Gowanda, village, located in two counties, Cattaraugus and Erie. Total for entire village given in bracketed line.

‡ Included in the village of Gowanda.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION: United States census, January 1, 1920	POPULATION: State enumeration, June 1, 1915	POPULATION: United States census, April 15, 1910
06	**Chautauqua county**	**115,348**	**116,818**	**105,126**
01	**Dunkirk city**	**19,336**	**17,870**	**17,221**
02	**Jamestown city**	**38,917**	**37,780**	**31,297**
50	Arkwright	757	843	843
51	Busti	1,281	1,649	1,572
20	*Lakewood village*	*714*	*702*	*564*
52	Carroll	1,761	1,714	1,564
53	Charlotte	731	801	716
*21**	*Sinclairville village (62)*	*514*	*582*	*542*
54	Chautauqua	2,326	2,732	2,393
22	*Mayville village*	*1,207*	*1,201*	*1,122*
34	*Chautauqua village*	....	....	....
55	Cherry Creek	677	910	774
23	*Cherry Creek village*	*527*	*720*	*603*
56	Clymer	1,205	1,341	1,164
57	Dunkirk	512	....	429
58	Ellery	1,269	1,606	1,695
33	*Bemus Point village*	*227*	*270*	....
59	Ellicott	1,964	2,154	1,611
24	*Celoron village*	*757*	*720*	*619*
25	*Falconer village*	*2,742*	*2,342*	*2,141*
60	Ellington	1,061	1,317	1,235
61	French Creek	806	941	882
62	Gerry (21)	921	1,119	1,155
63	Hanover	2,097	2,505	2.368
26	*Forestville village*	*620*	*740*	*721*
27	*Silver Creek village*	*3,260*	*3,220*	*2,512*
64	Harmony	1,145	2,720	2,510
28	*Panama village*	*298*	*352*	*337*
65	Kiantone	623	641	520
66	Mina	903	1,021	1,023
67	Poland	1,308	1,442	1,447
68	Pomfret	1,922	2,207	2,024
29	*Fredonia village*	*6,051*	*5,328*	*5,285*
69	Portland	1,757	2,060	1,877
30	*Brocton village*	*1,383*	*1,292*	*1,181*
70	Ripley	2,116	2,482	2,239
71	Sheridan	1,887	2.077	1,888
72	Sherman	620	783	732
31	*Sherman village*	*847*	*949*	*536*
73	Stockton	1,674	1,830	1,781
74	Villenova	961	1,148	1,140
75	Westfield	977	1,388	1,496
32	*Westfield village*	*3,413*	*3,319*	*2,985*
76	North Harmony	1,235	....	....
	Indian Reservations	39	....	69
07	**Chemung county**	**65,872**	**59,017**	**54,662**
01	**Elmira city**	**45,393**	**40,093**	**37,176**
50	Ashland	369	350	337
20	*Wellsburg village*	*465*	*478*	*432*
51	Baldwin	503	539	476
52	Big Flats	1,454	1,495	1,535
53	Catlin	737	834	870
54	Chemung	1,147	1,383	1,328
55	Elmira	1,647	1,385	1,113
21†	*Elmira Heights village (57)*	*4,188*	*3,154*	*2,732*
56	Erin	761	840	889
57	Horseheads (21)	1,547	1,516	1,358

* Sinclairville, village, located in two towns, Charlotte and Gerry. Total shown represents entire population of this village.

† Elmira Heights, village, located in two towns, Elmira and Horseheads. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION: United States census, January 1, 1920	POPULATION: State enumeration, June 1, 1915	POPULATION: United States census, April 15, 1910
	CHEMUNG COUNTY — — (*Concluded*)			
22	*Horseheads village*	*2,078*	*1,949*	*1,778*
58	Southport	3,084	2,320	2,034
59	Van Etten	678	709	658
23	*Van Etten village*	*350*	*407*	*476*
60	Veteran	1,471	1,565	1,470
08	**Chenango county**	**34,969**	**36,648**	**35,575**
01	**Norwich city**	**8,268**	**8,342**	**7,422**
50	Afton	1,058	1,055	1,051
20	*Afton village*	*782*	*754*	*729*
51	Bainbridge	750	803	858
21	*Bainbridge village*	*1,259*	*1,201*	*1,159*
52	Columbus	683	794	838
53	Coventry	733	793	764
54	German	365	412	371
55	Greene	1,620	1,687	1,717
22	*Greene village*	*1,297*	*1,272*	*1,275*
56	Guilford	1,818	1,963	2,013
57	Lincklaen	532	532	570
58	McDonough	765	825	813
59	New Berlin	1,034	1,311	1,214
23	*New Berlin village*	*1,070*	*1,131*	*1,114*
60	North Norwich	619	699	691
61	Norwich	1,063	1,201	1,138
62	Otselic	996	967	1,104
63	Oxford	1,281	1,479	1,360
25	*Oxford village*	*1,590*	*1,594*	*1,654*
64	Pharsalia	553	699	657
65	Pitcher	609	656	664
66	Plymouth	885	959	913
67	Preston	618	640	649
68	Sherburne	1,473	1,539	1,461
26	*Earlville village*	*243*	*(253*	*pt. 262)*
[*26**	*Earlville village (2,656)*	*792*	*845*	*874*]
27	*Sherburne village*	*1,104*	*1,016*	*960*
69	Smithville	843	932	949
70	Smyrna	797	892	948
28	*Smyrna village*	*261*	*247*	*257*
09	**Clinton county**	**43,898**	**47,561**	**48,230**
01	**Plattsburg city**	**10,909**	**10,134**	**11,138**
50	Altona	1,911	2,328	2,383
51	Ausable	823	971	999
20	*Keeseville village*	*813*	*(997*	*pt. 1,046)*
[*20*†	*Keeseville village (1,550)*	*1,524*	*1,795*	*1,835*]
52	Beekmantown	1,590	1,862	1,866
53	Black Brook	1,822	1,962	1,959
54	Champlain	1,695	1,517	1,719
21	*Champlain village*	*1,140*	*1,279*	*1,280*
22	*Rouses Point village*	*1,700*	*1,783*	*1,638*
55	Chazy	2,607	3,187	2,973
56	Clinton	1,395	1,386	1,598
57	Dannemora	1,770	3,663	3,057
23‡	*Dannemora village (62)*	*2,623*	*869*	*1,146*
58	Ellenburgh	2,475	2,965	3,079
59	Mooers	2,276	2,653	2,603
24	*Mooers village*	*512*	*522*	*560*

* Earlville, village, located in two counties, Chenango and Madison. Total for entire village given in bracketed line.

† Keeseville, village, located in two counties, Clinton and Essex. Total for entire village given in bracketed line.

‡ Dannemora, village, located in two towns, Dannemora and Saranac. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION: United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	CLINTON COUNTY — (*Concluded*)			
60	Peru	2,000	2,356	2,236
61	Plattsburg	2,085	2,380	2,362
62	Saranac (23)	2,352	3,114	3,000
63	Schuyler Falls	1,400	1,633	1,588
10	**Columbia county**	**38,930**	**44,111**	**43,658**
01	**Hudson city**	**11,745**	**11,544**	**11,417**
50	Ancram	1,015	1,110	1,137
51	Austerlitz	666	889	811
52	Canaan	1,085	1,057	1,167
53	Chatham	1,132	2,215	2,282
*20**	*Chatham village (59)*	*2,710*	*2,389*	*2,251*
54	Claverack	1,828	2,343	2,301
21	*Philmont village*	*1,919*	*2,060*	*1,813*
55	Clermont	667	881	800
56	Copake	1,114	1,368	1,283
57	Gallatin	633	780	720
58	Germantown	1,424	1,745	1,649
59	Ghent (20)	1,314	1,815	1,682
60	Greenport	1,103	1,470	1,639
61	Hillsdale	1,052	1,313	1,504
62	Kinderhook	912	1,109	1,030
22	*Kinderhook village*	*722*	*827*	*698*
23	*Valatie village*	*1,301*	*1,410*	*1,219*
63	Livingston	1,339	1,522	1,620
64	New Lebanon	1,133	1,369	1,378
65	Stockport	1,909	2,313	2,506
66	Stuyvesant	1,541	1,841	1,980
67	Taghkanic	666	741	771
11	**Cortland county**	**29,625**	**30,074**	**29,249**
01	**Cortland city**	**13,294**	**12,367**	**11,504**
50	Cincinnatus	941	958	965
51	Cortlandville	2,137	2,379	2,165
20†	*Homer village (55)*	*2,356*	*2,871*	*2,695*
21	*McGrawville village*	*1,032*	*887*	*931*
52	Cuyler	813	945	881
53	Freetown	485	511	551
54	Harford	553	728	623
55	Homer (20)	1,266	874	1,255
56	Lapeer	423	465	475
57	Marathon	731	494	510
22	*Marathon village*	*565*	*1,006*	*1,079*
58	Preble	678	761	757
59	Scott	625	683	718
60	Solon	498	545	518
61	Taylor	647	703	711
62	Truxton	920	1,089	1,132
63	Virgil	1,069	1,201	1,136
64	Willett	592	607	643
12	**Delaware county**	**42,774**	**45,995**	**45,575**
50	Andes	1,528	1,679	1,593
20	*Andes village*	*394*	*405*	*414*
51	Bovina	858	867	912
52	Colchester	2,849	3,250	3,193
53	Davenport	1,313	1,393	1,427

*Chatham, village, located in two towns, Chatham and Ghent. Total shown represents entire population of this village.

†Homer, village, located in two towns, Cortlandville and Homer. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	DELAWARE COUNTY — (*Concluded*)			
54	Delhi	1,052	1,109	1,079
21	*Delhi village*	*1,669*	*1,743*	*1,736*
55	Deposit	674	892	921
*22**	*Deposit village (0361)*	*741*	*753*	*pt. 790*
56	Franklin	1,656	1,781	1,930
23	*Franklin village*	*476*	*441*	*473*
57	Hamden	1,248	1,387	1,373
58	Hancock	2,796	3,552	3,862
24	*Hancock village*	*1,326*	*1,356*	*1,329*
59	Harpersfield	893	936	955
25	*Stamford village (66)*	*947*	*1,060*	*973*
60	Kortright	1,559	1,608	1,481
61	Masonville	878	988	1,053
62	Meredith	1,394	1,472	1,393
63	Middletown	2,347	2,611	3,133
30	*Fleischmanns village*	*525*	*767*	....
26	*Margaretville village*	*650*	*648*	*669*
64	Roxbury	2,258	2,318	2,164
65	Sidney	1,463	1,574	1,641
27	*Sidney village*	*2,670*	*2,641*	*2,507*
66	Stamford (25)	861	974	885
28	*Hobart village*	*587*	*596*	*544*
67	Tompkins	1,737	1,919	2,127
68	Walton	1,827	1,669	1,985
29	*Walton village*	*3,598*	*3,606*	*3,103*
13	**Dutchess county**	**91,747**	**91,044**	**87,661**
01	**Beacon city**	**10,996**	**10,165**	**10,629**
02	**Poughkeepsie city**	**35,000**	**32,714**	**27,936**
50	Amenia	1,831	2,204	2,123
51	Beekman	844	951	827
52	Clinton	1,198	1,333	1,278
53	Dover	1,710	1,967	2,016
54	East Fishkill	1,944	2,173	2,226
55	Fishkill	1,616	2,683	2,713
20	*Fishkill village*	*479*	*531*	*516*
56	Hyde Park	2,880	3,144	3,019
57	LaGrange	1,132	1,326	1,350
58	Milan	704	824	893
59	Northeast	1,093	1,452	1,252
21	*Millerton village*	*829*	*890*	*858*
60	Pawling	923	1,153	1,079
22	*Pawling village*	*1,032*	*1,050*	*848*
61	Pine Plains	1,252	1,387	1,420
62	Pleasant Valley	776	908	931
23	*Pleasant Valley village*	*384*	*429*	*427*
63	Poughkeepsie	9,502	4,937	7,702
24†	*Wappingers Falls village (68)*	*3,235*	*3,742*	*3,195*
64	Red Hook	1,515	1,805	1,711
25	*Red Hook village*	*827*	*923*	*960*
26	*Tivoli village*	*876*	*1,080*	*1,034*
65	Rhinebeck	1,373	1,905	1,984
27	*Rhinebeck village*	*1,397*	*1,580*	*1,548*
66	Stanford	1,368	1,582	1,520
67	Union Vale	987	1,149	1,097
68	Wappinger (24)	1,249	1,524	1,542
69	Washington	1,699	2,286	1,891
28	*Millbrook village*	*1,096*	*1,252*	*1,136*

* See Deposit, Broome county, for entire population.

† Wappingers Falls, village, located in two towns, Poughkeepsie and Wappinger. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	Population: United States census, January 1, 1920	Population: State enumeration, June 1, 1915	Population: United States census, April 15, 1910
14	**Erie county**	**634,688**	**571,897**	**528,985**
01	**Buffalo city**	**506,775**	**454,630**	**423,715**
02	**Lackawanna city**	**17,918**	**15,737**	**14,549**
03	**Tonawanda city**	**10,068**	**9,147**	**8,290**
50	Alden	1,678	2,089	1,920
20	*Alden village*	*755*	*777*	*1,828*
51	Amherst	4,533	4,117	3,524
21	*Williamsville village*	*1,753*	*1,272*	*1,105*
52	Aurora	1,609	2,001	1,698
22	*East Aurora village*	*3,703*	*3,445*	*2,781*
53	Boston	1,325	1,489	1,535
54	Brant	1,314	2,218	1,585
23	*Farnham village*	*516*	*636*	*540*
55	Cheektowaga	9,230	6,441	5,641
*24**	*Depew village* (*67*)	*5,850*	*4,932*	*3,921*
25	*Sloan village*	*1,791*	*2,202*	*1,259*
56	Clarence	2,660	3,082	2,991
57	Colden	1,259	1,390	1,303
58	Collins	3,221	1,929	3,079
26†	*Gowanda village* (*0476*)	*840*	(*724*)	*pt. 663*)
59	Concord	1,892	1,882	2,145
27	*Springville village*	*2,331*	*2,688*	*2,246*
60	East Hamburg	3,120	3,004	2,636
61	Eden	2,352	2,616	2,526
62	Elma	1,966	2,282	2,130
63	Evans	2,101	2,450	2,226
28	*Angola village*	*1,367*	*1,194*	*898*
64	Grand Island	728	964	914
65	Hamburg	4,070	3,690	3,076
29	*Blasdell village*	*1,401*	*940*	*849*
30	*Hamburg village*	*3,185*	*2,744*	*2,134*
66	Holland	1,410	1,584	1,468
67	Lancaster (24)	2,165	2,466	2,128
31	*Lancaster village*	*6,059*	*5,094*	*4,364*
68	Marilla	1,237	1,409	1,382
69	Newstead	2,083	2,167	2,020
32	*Akron village*	*1,960*	*1,856*	*1,677*
70	North Collins	1,113	1,637	2,424
34	*North Collins village*	*1,158*	*1,068*	....
71	Sardinia	1,518	1,661	1,644
72	Tonawanda	2,345	1,362	1,155
33	*Kenmore village*	3,160	1,700	1,020
73	Wales	985	1,197	1,203
74	West Seneca	7,062	5,926	4,605
	Indian Reservation	1,122	58	1,188
15	**Essex county**	**31,871**	**32,461**	**33,458**
50	Chesterfield	827	1,067	1,040
20‡	*Keeseville village* (*0951*)	*711*	(*798*	*pt. 789*)
51	Crown Point	1,413	1,605	1,690
52	Elisabethtown	524	675	603
21	*Elizabethtown village*	*518*	*530*	*505*
53	Essex	1,025	1,193	1,276
54	Jay	2,226	2,382	2,231
55	Keene	1,032	1,138	1,227
56	Lewis	739	844	937
57	Minerva	610	705	848
58	Moriah	4,443	3,423	4,488

* Depew, village, located in two towns, Cheektowaga and Lancaster. Total shown represents entire population of this village.

† See Gowanda, Cattaraugus county, for entire population.

‡ See Keeseville, Clinton county for entire population.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION: United States census, January 1, 1920	POPULATION: State enumeration, June 1, 1915	POPULATION: United States census, April 15, 1910
	ESSEX COUNTY — (*Concluded*)			
22	*Port Henry village*	*2,183*	*2,684*	2,266
59	Newcomb	313	511	509
60	North Elba	1,234	1,053	1,195
23	*Lake Placid village*	*2,099*	*1,977*	*1,682*
24	*Saranac Lake village*	*1,010*	*(843*	*pt. 1,019)*
[24*	*Saranac Lake village (62, 1663)*	*5,174*	*4,918*	*4,983]*
61	North Hudson	397	477	434
62	St. Armand	128	558	297
25	*Bloomingdale village*	*490*	*394*	*382*
(26)	*Saranac Lake village (60, 1663)*	*109*	*(60*	*pt. 67)*
63	Schroon	852	967	1,013
64	Ticonderoga	3,165	1,992	2,465
27	*Ticonderoga village*	*2,102*	*2,754*	*2,475*
65	Westport	823	970	1,175
28	*Westport village*	*669*	*716*	*692*
66	Willsboro	1,684	1,652	1,580
67	Wilmington	545	593	573
16	**Franklin county**	**43,541**	**46,181**	**45,717**
50	Altamont	2,419	570	1,624
20	*Tupper Lake village*	*2,508*	*3,910*	*3,067*
51	Bangor	1,565	1,795	1,946
25	*North Bangor village*	*362*	*384*	....
52	Belmont	1,552	2,031	2,341
53	Bombay	1,251	1,337	1,339
54	Brandon	728	860	872
55	Brighton	684	777	741
56	Burke	1,578	1,835	1,772
57	Chateaugay	1,565	1,707	1,795
21	*Chateaugay village*	*1,291*	*1,196*	*1,045*
58	Constable	1,100	1,331	1,323
59	Dickinson	1,312	1,514	1,609
60	Duane	209	255	300
61	Fort Covington	1,130	1,217	1,151
22	*Fort Covington village*	*836*	*828*	*877*
62	Franklin	1,280	1,378	1,447
63	Harrietstown	742	701	856
23	*Saranac Lake village (1560, 1562)*	*4,055*	*(4,015*	*pt. 3,897)*
64	Malone	3,274	3,851	3,687
24	*Malone village*	*7,556*	*7,404*	*6,467*
65	Moira	2,264	2,413	2,346
66	Santa Clara	541	525	675
67	Waverly	1,695	2,133	2,170
68	Westville	1,028	1,128	1,121
	Indian Reservation	1,016	1,086	1,249
17	**Fulton county**	**44,927**	**45,625**	**44,534**
01	**Gloversville city**	**22,075**	**21,178**	**20,642**
02	**Johnstown city**	**10,908**	**10,687**	**10,447**
50	Bleecker	389	498	500
51	Broadalbin	1,949	2,030	1,845
52	Caroga	332	516	441
53	Ephratah	1,038	1,288	1,312
54	Johnstown	1,948	2,694	2,511
55	Mayfield	1,274	1,500	1,475
20	*Mayfield village*	*592*	*595*	*590*
56	Northampton	1,001	596	1,098
21	*Northville village*	*1,190*	*1,635*	*1,130*
57	Oppenheim	964	974	1,066
(*22*)	*Dolgeville village*	*218*	*(187*	*pt. 175)*

* Saranac Lake, village, located in two counties, Essex and Franklin. Total for entire village given in bracketed line.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of 1920, 1915 and 1910 with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION — United States census, January 1, 1920	POPULATION — State enumeration, June 1, 1915	POPULATION — United States census, April 15, 1910
	FULTON COUNTY — (*Concluded*)			
[22*	*Dolgeville village (2158)*	*3,448*	*3,326*	*2,685*]
58	Perth	596	713	695
59	Stratford	453	534	607
18	**Genesee county**	**37,976**	**40,707**	**37,615**
01	**Batavia city**	**13,541**	**13,278**	**11,613**
50	Alabama	1,530	1,697	1,797
51	Alexander	1,093	1,144	1,150
20	*Alexander village*	*194*	*259*	*212*
52	Batavia	1,752	2,062	2,217
53	Bergen	921	1,077	994
21	*Bergen village*	*576*	*639*	*637*
54	Bethany	1,196	1,394	1,270
55	Byron	1,273	1,501	1,520
56	Darien	1,617	2,013	1,779
57	Elba	1,008	1,315	1,033
22	*Elba village*	*386*	*439*	*351*
58	Leroy	1,307	1,746	1,671
23	*Leroy village*	*4,203*	*4,084*	*3,771*
59	Oakfield	1,016	950	879
24	*Oakfield village*	*1,422*	*1,307*	*1,236*
60	Pavilion	1,337	1,615	1,462
61	Pembroke	1,744	1,958	1,888
25	*Corfu village*	*458*	*515*	*413*
62	Stafford	1,057	1,259	1,288
	Indian Reservation	345	455	434
19	**Greene county**	**25,796**	**30,091**	**30,214**
50	Ashland	560	658	640
51	Athens	517	800	764
20	*Athens village*	*1,844*	*1,925*	*1,956*
52	Cairo	1,487	1,967	1,841
53	Catskill	2,942	3,650	3,770
21	*Catskill village*	*4,728*	*5,371*	*5,296*
54	Coxsackie	873	1,144	1,126
22	*Coxsackie village*	*2,121*	*2,309*	*2,494*
55	Durham	1,211	1,363	1,475
56	Greenville	1,362	1,550	1,556
57	Halcott	272	353	331
58	Hunter	1,029	1,781	1,631
23	*Hunter village*	*683*	*405*	*408*
24	*Tannersville village*	*597*	*758*	*660*
59	Jewett	883	1,014	1,057
60	Lexington	1,075	926	1,054
61	New Baltimore	1,536	1,840	1,936
62	Prattsville	830	887	781
63	Windham	1,246	1,390	1,438
20	**Hamilton county**	**3,970**	**4,491**	**4,373**
50	Arietta	176	319	232
51	Benson	119	155	143
52	Hope	203	250	258
53	Indian Lake	1,031	1,086	1,045
54	Inlet	171	219	197
55	Lake Pleasant	393	429	458
56	Long Lake	1,116	1,058	1,149
57	Morehouse	109	133	149
58	Wells	652	842	742

* Dolgeville, village, located in two counties, Fulton and Herkimer. Total for entire village given in bracketed line.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
21	**Herkimer county**	**64,962**	**64,109**	**56,356**
01	**Little Falls city**	**13,029**	**13,022**	**12,273**
50	Columbia	911	1,090	1,071
51	Danube	746	1,050	941
52	Fairfield	895	957	680
*20**	*Middleville village (59)*	*790*	*710*	*625*
53	Frankfort	2,285	1,749	1,802
21	*Frankfort village*	*4,198*	*4,213*	*3,303*
54	German Flats	1,001	1,332	1,493
22	*Ilion village*	*10,169*	*8,900*	*6,588*
23	*Mohawk village*	*2,919*	*2,577*	*2,079*
55	Herkimer	1,529	1,450	1,277
24	*Herkimer village*	*10,453*	*9,577*	*7,520*
56	Litchfield	747	836	803
57	Little Falls	684	627	638
58	Manheim	656	746	845
(25)†	*Dolgeville (1,757)*	*3,230*	*(3,139*	*pt. 2,510)*
59	Newport (20)	570	627	575
26	*Newport village*	*703*	*697*	*583*
27§	*Poland village (62)*	*349*	*315*	*332*
60	Norway	488	597	642
61‡	Ohio	583	496	527
62	Russia (27)	902	1,225	1,414
28	*Cold Brook village*	*261*	*274*	*358*
63	Salisbury	1,418	1,643	1,468
64	Schuyler	1,007	1,130	1,227
65	Stark	811	906	897
66	Warren	959	1,288	1,071
67‡	Webb	792	759	785
29	*Old Forge village*	*565*	*615*	*465*
68‡	Wilmurt	....	227	178
69	Winfield	587	647	660
30	*West Winfield village*	*725*	*788*	*726*
22	**Jefferson county**	**82,250**	**81,009**	**80,382**
01	**Watertown city**	**31,285**	**26,895**	**26,730**
50	Adams	1,637	1,708	1,670
20	*Adams village*	*1,557*	*1,571*	*1,458*
51	Alexandria	1,918	2,293	2,360
21	*Alexandria Bay village*	1,649	2,062	1,899
52	Antwerp	1,557	1,705	1,874
22	*Antwerp village*	*1,012*	*1,057*	*974*
53	Brownville	1,098	1,181	1,234
23	*Brownville village*	*976*	*885*	*854*
24	*Dexter village*	*1,164*	*1,145*	*1,005*
25=	*Glen Park village*	*661*	*650*	*522*
54	Cape Vincent	1,198	1,412	1,420
26	*Cape Vincent village*	*913*	*1,102*	*1,155*
55	Champion	1,188	1,403	1,311
27	*West Carthage village*	*1,666*	*1,587*	*1,393*
56	Clayton	1,769	2,097	2,087
28	*Clayton village*	*1,849*	*1,879*	*1,941*
57	Ellisburg	2,346	2,274	2,258
29	*Belleville village*	*306*	*260*	*344*
30	*Ellisburg village*	*275*	*316*	*702*
31	*Mannsville village*	*265*	*617*	*330*
58	Henderson	930	1,071	1,145

* Middleville, village, located in two towns, Fairport and Newport. Total shown represents entire population of this village.

† See Dolgeville, Fulton county, for entire population.

‡ Totals for 1920 include population of Wilmurt annexed to Ohio and Webb since 1910.

§ Poland, village, located in two towns, Newport and Russia. Total shown represents entire population of this village.

= Glen Park, village, located in two towns, Brownville and Pamelia. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION: United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	JEFFERSON COUNTY — (*Concluded*)			
32	*Henderson village*	*299*	*380*	*340*
59	Hounsfield	1,630	1,364	1,349
33	*Sacketts Harbor village*	*667*	*689*	*868*
60	Le Ray	1,907	2,053	1,639
*34**	*Black River village (67)*	*937*	*857*	*916*
61	Lorraine	790	993	940
62	Lyme	1,047	1,187	1,247
35	*Chaumont village*	*595*	*682*	*708*
63	Orleans	1,869	2,269	2,160
64	Pamelia	945	980	976
65	Philadelphia	755	746	798
36	*Philadelphia village*	*794*	*847*	*842*
66	Rodman	1,027	1,167	1,123
67	Rutland (34)	1,332	1,394	1,862
68	Theresa	905	1,007	1,104
37	*Theresa village*	*857*	*1,063*	*932*
69	Watertown	1,116	1,179	1,097
70	Wilna	2,694	2,522	2,655
38	*Carthage village*	*4,320*	*3,871*	*3,563*
71	Worth	545	579	597
24	**Lewis county**	**23,704**	**25,947**	**24,849**
50	Croghan	2,139	2,532	2,373
20†	*Croghan village (62)*	*646*	*659*	*621*
51	Denmark	1,351	1,421	1,304
21	*Copenhagen village*	*554*	*695*	*585*
52	Diana	1,281	1,448	1,358
22	*Harrisville village*	*900*	*991*	*921*
53	Greig	635	758	807
54	Harrisburg	619	677	686
55	High Market	316	390	409
56	Lewis	753	733	801
57	Leyden	923	1,066	1,010
23‡	*Port Leyden village (59)*	*735*	*753*	*764*
58	Lowville	788	860	935
24	*Lowville village*	*3,127*	*3,244*	*2,940*
59	Lyonsdale (23)	743	822	809
25§	*Lyons Falls village (67)*	*818*	*863*	*759*
60	Martinsburg	1,566	1,761	1,546
61	Montague	450	489	531
62	New Bremen (*20*)	1,375	1,441	1,422
63	Osceola	431	467	456
64	Pinckney	688	804	806
65	Turin	689	769	681
26	*Turin village*	*327*	*339*	*349*
66	Watson	707	771	757
67	West Turin (25)	763	803	812
27	*Constableville village*	*380*	*391*	*407*
25	**Livingston county**	**36,830**	**38,427**	**38,037**
50	Avon	765	1,432	1,379
20	*Avon village*	*2,585*	*2,430*	*2,053*
51	Caledonia	818	861	958
21	*Caledonia village*	*1,170*	*1,241*	*1,290*

* Black River, village, located in two towns, LeRay and Rutland. Total shown represents entire population of this village.
† Croghan village, located in two towns, Croghan and New Bremen. Total shown represents entire population of this village.
‡ Port Leyden village, located in two towns, Leyden and Lyonsdale. Total shown represents entire population of this village.
§ Lyons Falls village, located in two towns, Lyonsdale and West Turin. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	Population: United States census, January 1, 1920	Population: State enumeration, June 1, 1915	Population: United States census, April 15, 1910
	LIVINGSTON COUNTY (*Concluded*)			
52	Conesus	814	1,041	937
53	Geneseo	850	1,095	1,121
22	*Geneseo village*	*2,157*	*2,253*	*2,067*
54	Groveland	2,920	1,699	2,820
55	Leicester	1,407	1,506	1,398
*23**	*Leicester village*	*279*	*305*	*304*
56	Lima	1,047	1,196	1,202
24	*Lima village*	*843*	*922*	*866*
57	Livonia	1,857	2,142	1,996
25	*Livonia village*	*743*	*857*	*823*
58	Mt. Morris	1,158	1,171	1,222
26	*Mt. Morris village*	*3,312*	*3,884*	*2,782*
59	North Dansville	162	272	390
27	*Dansville village*	*4,631*	*4,018*	*3,938*
60	Nunda	1,120	1,149	1,318
28	*Nunda village*	*1,152*	*1,140*	*1,043*
61	Ossian	596	666	730
62	Portage	860	962	1,273
63	Sparta	833	894	985
64	Springwater	1,416	1,689	1,808
65	West Sparta	695	800	772
66	York	2,640	2,802	2,562
26	**Madison county**	**39,535**	**41,742**	**39,289**
01	**Oneida city**	**10,541**	**9,461**	**8,317**
50	Brookfield	1,775	1,930	2,008
20	*Brookfield village*	*317*	*400*	*395*
51	Cazenovia	1,660	1,939	1,826
21	*Cazenovia village*	*1,683*	*1,928*	*1,861*
52	DeRuyter	622	663	658
22	*DeRuyter village*	*519*	*604*	*538*
53	Eaton	1,726	1,979	1,917
23	*Morrisville village*	*497*	*582*	*500*
54	Fenner	780	836	807
55	Georgetown	854	989	925
56	Hamilton	1,300	1,473	1,524
(*24*)†	*Earlville village (0868)*	*549*	*(592*	*pt. 612)*
25	*Hamilton village*	*1,505*	*1,586*	*1,689*
57	Lebanon	940	1,116	1,079
58	Lenox	1,265	1,446	1,392
26	*Canastota village*	*3,995*	*3,849*	*3,247*
27	*Wampsville village*	*276*	*222*	*212*
59	Lincoln	821	950	985
60	Madison	1,364	1,519	1,617
28	*Madison village*	*265*	*317*	*309*
61	Nelson	1,099	1,230	1,139
62	Smithfield	767	904	880
63	Stockbridge	1,036	1,544	1,485
30	*Munnsville village*	*377*	....	....
64	Sullivan	2,352	2,609	2,689
29	*Chittenango village*	*650*	*1,074*	*678*
27	**Monroe county**	**352,034**	**319,313**	**283,212**
01	**Rochester city**	**295,750**	**248,465**	**218,149**
50	Brighton	2,911	2,974	3,998
51	Chili	1,780	2,050	2,071
52	Clarkson	1,403	1,657	1,549
53	Gates	1,419	5,498	4,862
54	Greece	3,350	10,794	7,777
55	Hamlin	1,999	2,458	2,184

* Name changed from Moscow, 1917.
† See Earlville, Chenango county, for entire population.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION		
		United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	MONROE COUNTY — (*Concluded*)			
56	Henrietta	1,910	2,083	1,972
57	Irondequoit	5,123	4,608	3,526
58	Mendon	1,402	1,638	1,585
21	*Honeoye Falls village*	*1,107*	*1,258*	*1,169*
59	Ogden	1,755	1,952	2,143
22	*Spencerport village*	*926*	*848*	*1,000*
60	Parma	2,096	2,451	2,327
23	*Hilton village*	*827*	*817*	*627*
61	Penfield	2,087	2,967	2,977
62	Perinton	1,205	2,107	1,981
*24**	*East Rochester village (63)*	*3,901*	*3,471*	*2,398*
25	*Fairport village*	*4,626*	*3,556*	*3,112*
63	P ttsford (24)	1,353	1,534	1,504
26	*Pittsford village*	*1,328*	*1,376*	*1,205*
64	Riga	1,136	1,257	1,288
27	*Churchville village*	*513*	*583*	*565*
65	Rush	2,091	1,578	2,150
66	Sweden	1,094	1,267	1,306
28	*Brockport village*	*2,980*	*3,368*	*3,579*
67	Webster	2,729	2,950	2,723
29	*Webster village*	*1,247*	*1,459*	*1,032*
68	Wheatland	1,292	1,414	2,453
30	*Scottsville village*	*784*	*900*	....
28	**Montgomery county**	**57,928**	**61,030**	**57,567**
01	**Amsterdam city**	**33,524**	**34,319**	**31,267**
50	Amsterdam	1,595	1,742	1,599
20	*Fort Johnson village*	*680*	*681*	*600*
21	*Hagaman village*	*855*	*952*	*875*
51	Canajoharie	1,369	1,549	1,616
22	*Canajoharie village*	*2,415*	*2,474*	*2,273*
52	Charleston	785	898	900
53	Florida	1,651	1,912	1,904
54	Glen	913	1,110	1,190
23	*Fultonville village*	*869*	*955*	*812*
55	Minden	1,619	1,706	1,883
24	*Fort Plain village*	*2,747*	*2,923*	*2,762*
56	Mohawk	1,145	1,455	1,388
25	*Fonda village*	*1,208*	*1,120*	*1,100*
57	Palatine	1,125	1,825	1,388
26	*Nelliston village*	*664*	*716*	*737*
27	*Palatine Bridge village*	*443*	*408*	*392*
58	Root	1,198	1,327	1,512
59	St. Johnsville	654	753	833
28	*St. Johnsville village*	*2,469*	*2,705*	*2,536*
29	**Nassau county**	**126,120**	**116,825**	**83,930**
01	**Glen Cove city**	**8,664**	....	....
50	**Hempstead**	**32,999**	**38,167**	**27,216**
20	*East Rockaway village*	*2,005*	*1,607*	*1,200*
21†	*Floral Park village (51)*	*2,097*	*1,771*	*1,225*
22	*Freeport village*	*8,599*	*7,463*	*4,836*
23	*Hempstead village*	*6,382*	*6,073*	*4,964*
24	*Lawrence village*	*2,861*	*1,870*	*1,189*
25	*Rockville Center village*	*6,262*	*5,223*	*3,667*
29	*Cedarhurst village*	*2,838*	*2,657*	....
30	*Lynbrook village*	*4,371*	*3,055*	....
31	*Long Beach village*	*282*	*662*	....

* East Rochester, village, located in two towns, Perinton and Pittsford. Total shown represents entire population of this village.

† Floral Park, village, located in two towns, Hempstead and North Hempstead. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION		
		United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	NASSAU COUNTY — (*Concluded*)			
36	*Woodsburgh village*	*220*	*168*	....
37	*Garden City village*	*2,420*	....	....
51	North Hempstead (21)	21,795	19,888	15,850
26	*Mineola village*	*3,016*	*2,318*	*1,981*
32	*Plandome village*	*319*	*255*	....
33	*Great Neck Est. village*	*339*	*175*	....
34	*Saddle Rock village*	*71*	*71*	....
35	*Sands Point village*	*284*	*535*	....
52	Oyster Bay	16,097	26,030	18,541
27	*Farmingdale village*	*2,091*	*1,856*	*1,567*
28	*Sea Cliff village*	*2,108*	*1,981*	*1,694*
31	**Niagara county**	**118,705**	**108,550**	**92,036**
01	**Lockport city**	**21,308**	**18,693**	**17,970**
02	**Niagara Falls city**	**50,760**	**42,257**	**30,445**
03	**No. Tonawanda city**	**15,482**	**13,498**	**11,955**
50	Cambria	1,596	1,892	1,749
51	Hartland	1,853	2,659	2,517
*20**	*Middleport village (58)*	*1,416*	*1,427*	*1,530*
52	Lewiston	2,027	2,535	2,133
21	*Lewiston village*	*723*	*741*	*713*
53	Lockport	1,833	2,077	2,399
54	Newfane	3,515	4,537	4,060
55	Niagara	360	336	349
22	*La Salle village*	*3,813*	*2,402*	*1,299*
56	Pendleton	1,175	1,323	1,267
57	Porter	2,143	1,933	2,099
23	*Youngstown village*	*539*	*571*	*556*
58	Royalton (20)	3,203	3,703	3,547
59	Somerset	1,572	1,870	1,819
24	*Barker village*	*431*	*550*	*441*
60	Wheatfield	1,884	1,936	1,792
61	Wilson	2,122	2,475	2,324
25	*Wilson village*	*631*	*741*	*655*
	Indian Reservation	319	394	417
32	**Oneida county**	**182,833**	**167,331**	**154,157**
01	**Rome city**	**26,341**	**21,926**	**20,497**
02	**Utica city**	**94,156**	**80,589**	**74,419**
03	**Sherrill city**	**1,761**	....	....
50	Annsville	1,353	1,450	1,449
51	Augusta	897	1,083	1,067
20	*Oriskany Falls village*	*1,014*	*973*	*892*
52	Ava	615	659	563
53	Boonville	1,238	1,351	1,397
21	*Boonville village*	*1,914*	*1,909*	*1,794*
54	Bridgewater	514	604	587
22	*Bridgewater village*	*232*	*258*	*245*
55	Camden	1,113	1,178	1,256
23	*Camden village*	*1,941*	*2,181*	*2,170*
56	Deerfield	706	1,836	1,660
57	Florence	701	970	936
58	Floyd	663	702	697
59	Forestport	479	665	593
24	*Forestport village*	*383*	*505*	*507*
60	Kirkland	3,474	3,517	3,097
25	*Clinton village*	*1,270*	*1,264*	*1,236*
61	Lee	1,134	1,313	1,379
62	Marcy	1,191	1,260	1,301
63	Marshall	1,318	1,543	1,502

* Middleport, village, located in two towns, Hartland and Middleport. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION		
		United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	ONEIDA COUNTY — (*Concluded*)			
*26**	*Waterville village* (67)	*1,255*	*1,564*	*1,410*
64	New Hartford	7,025	6,405	4,752
27	*New Hartford village*	*1,621*	*1,459*	*1,195*
65	Paris	2,005	2,046	2,010
28	*Clayville village*	*999*	*972*	*649*
66	Remsen	540	566	666
29†	*Remsen village* (69)	*448*	*417*	*421*
67	Sangerfield (26)	712	739	918
68	Steuben	786	839	785
69	Trenton (29)	1,491	1,677	1,498
30	*Holland Patent village*	*328*	*339*	*337*
31	*Prospect village*	*282*	*339*	*278*
32	*Trenton village*	*269*	*316*	*289*
70	Vernon	1,754	2,910	2,353
33	*Oneida Castle village*	*466*	*399*	*393*
34	*Vernon village*	*541*	*532*	*451*
71	Verona	3,046	3,752	3,348
35	*New London village*	*90*	§*213*	*108*
72	Vienna	1,439	1,931	1,735
36	*Sylvan Beach village*	*105*	§*196*	*169*
73	Western	1,061	1,150	1,355
74	Westmoreland	1,984	2,115	1,995
75	Whitestown	4,532	4,459	4,732
37	*Whitesboro village*	*3,038*	*2,493*	*2,375*
38	*Yorkville village*	*1,512*	*1,086*	*691*
39	*Oriskany village*	*1,101*	*1,090*	....
33	**Onondaga county**	**241,465**	**213,992**	**200,298**
01	**Syracuse city**	**171,717**	**145,293**	**137,249**
50	Camillus	2,097	2,191	1,879
20	*Camillus village*	*808*	*840*	*763*
51	Cicero	2,536	2,689	2,475
52	Clay	2,488	2,661	2,431
53	DeWitt	3,979	4,190	3,338
21	*East Syracuse village*	*4,106*	*3,839*	*3,274*
22	*Eastwood village*	*2,194*	*777*	*810*
54	Elbridge	1,342	1,501	1,540
23	*Elbridge village*	*382*	*475*	*462*
24	*Jordan village*	*1,012*	*1,063*	*978*
55	Fabius	1,045	1,230	1,213
25	*Fabius village*	*240*	*340*	*344*
56	Geddes	643	853	820
26	*Solvay village*	*7,352*	*5,886*	*5,139*
57	LaFayette	1,293	1,447	1,413
58	Lysander	2,488	2,746	2,644
27‡	*Baldwinsville village* (68)	*3,685*	*3,290*	*3,099*
59	Manlius	2,852	2,550	3,221
28	*Fayetteville village*	*1,584*	*1,779*	*1,481*
34	*Minoa village*	*867*	*668*	....
29	*Manlius village*	*1,296*	*1,304*	*1,314*
60	Marcellus	1,865	1,936	1,909
30	*Marcellus village*	*989*	*991*	*917*
61	Onondaga	6,620	6,267	5,963
62	Otisco	914	1,058	1,066
63	Pompey	1,882	2,344	2,093

* Waterville, village, located in two towns, Marshall and Sangerfield. Total shown represents entire population of this village.

† Remsen, village, located in two towns, Remsen and Trenton. Total shown represents entire population of this village.

‡ Baldwinsville, village, located in two towns, Lysander and Van Buren. Total shown represents entire population of this village.

§ Disorganized; population included in town for 1915.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION: United States census, January 1, 1920	POPULATION: State enumeration, June 1, 1915	POPULATION: United States census, April 15, 1910
	ONONDAGA COUNTY — (*Concluded*)			
64	Salina	2,426	2,367	1,820
31	*Liverpool village*	*1,831*	*1,591*	*1,388*
65	Skaneateles	2,612	2,851	2,659
32	*Skaneateles village*	*1,635*	*1,768*	*1,615*
66	Spafford	875	1,082	1,064
67	Tully	881	1,015	835
33	*Tully village*	*477*	*559*	*551*
68	Van Buren (27)	1,977	2,034	1,966
	Indian Reservation	475	587	565
10	State Institution for Feeble-minded, Syracuse	....	....	....
34	**Ontario county**	**52,652**	**54,628**	**52,286**
01	**Canandaigua city**	**7,356**	**7,501**	**7,217**
02	**Geneva city**	**14,648**	**13,232**	**12,446**
50	Bristol	896	1,143	1,247
51	Canadice	457	556	559
52	Canandaigua	1,858	2,140	2,188
53	East Bloomfield	871	1,975	1,892
27	*East Bloomfield village*	*356*	....	....
28	*Holcomb village*	*488*	....	....
54	Farmington	1,465	1,585	1,568
55	Geneva	1,251	1,386	1,086
56	Gorham	1,806	1,986	2,010
(*20*)	*Rushville village*	*130*	(*128*	*pt. 124*)
[*20* *	*Rushville village* (*6,156*)	*541*	*459*	*463*]
57	Hopewell	1,339	1,416	1,493
58	Manchester	1,556	1,828	1,707
21 †	*Clifton Springs village* (*60*)	*1,628*	*1,664*	*1,600*
22	*Manchester village*	*1,418*	*1,115*	*881*
23	*Shortsville village*	*1,300*	*1,228*	*1,112*
59	Naples	974	1,147	1,256
24	*Naples village*	*1,148*	*1,138*	*1,093*
60	Phelps (21)	2,670	3,092	2,968
25	*Phelps village*	*1,200*	*1,376*	*1,354*
61	Richmond	1,071	1,208	1,277
62	Seneca	2,638	3,001	2,669
63	South Bristol	696	964	965
64	Victor	1,374	1,563	1,512
26	*Victor village*	*945*	*1,054*	*881*
65	West Bloomfield	1,113	1,203	1,181
35	**Orange county**	**119,844**	**118,118**	**116,001**
01	**Middletown city**	**18,420**	**16,381**	**15,313**
02	**Newburgh city**	**30,366**	**27,876**	**27,805**
03	**Port Jervis city**	**10,171**	**9,413**	**9,564**
50	Blooming Grove	1,250	1,481	1,479
20	*Washingtonville village*	*631*	*635*	*631*
51	Chester	754	855	851
21	*Chester village*	*1,049*	*1,230*	*1,210*
52	Cornwall	2,504	2,870	3,032
22	*Cornwall village*	*1,755*	*2,240*	*2,658*
53	Crawford	1,507	1,693	1,659
54	Deerpark	1,615	1,753	1,696
55	Goshen	2,173	1,799	2,068
23	*Goshen village*	*2,843*	*3,511*	*3,081*
56	Greenville	618	836	644
57	Hamptonburg	1,104	1,184	1,168

* Rushville, village, located in two counties, Ontario and Yates. Total for entire village in bracketed line.

† Clifton Springs, village, located in two towns, Manchester and Phelps. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	ORANGE COUNTY — (*Concluded*)			
58	Highlands	3,548	1,536	3,663
24	*Highland Falls village*	*2,588*	*2,518*	*2,470*
59	Minisink	850	1,018	953
25	*Unionville village*	*402*	*387*	*351*
60	Monroe	423	515	1,090
26	*Monroe village*	*1,527*	*1,519*	*1,195*
30	*Harriman village*	*680*	*854*	....
61	Montgomery	1,952	1,864	2,494
27	*Montgomery village*	*906*	*957*	*941*
28	*Walden village*	*5,493*	*5,196*	*4,004*
62	Mt. Hope	1,708	1,589	1,786
63	Newburgh	4,034	4,807	5,132
64	New Windsor	2,984	2,745	2,667
65	Tuxedo	2,355	3,636	2,858
66	Wallkill	2,598	2,803	2,578
67	Warwick	5,042	5,608	4,823
29	*Warwick village*	*2,420*	*2,505*	*2,318*
68	Wawayanda	1,689	1,954	1,603
69	Woodbury	1,885	2,300	2,216
36	**Orleans county**	**28,619**	**32,919**	**32,000**
50	Albion	1,334	1,393	1,554
*20**	*Albion village (54)*	*4,683*	*5,988*	*5,016*
51	Barre	1,622	1,875	1,812
52	Carlton	1,832	2,289	2,259
53	Clarendon	1,139	1,373	1,335
54	Gaines (20)	1,498	1,853	1,831
55	Kendall	1,275	1,678	1,585
56	Murray	1,765	2,441	2,290
21	*Holley village*	*1,625*	*1,780*	*1,679*
57	Ridgeway	2,147	2,881	2,797
22†	*Medina village (58)*	*6,011*	*6,079*	*5,683*
58	Shelby (22)	*1,748*	*2,001*	*2,003*
59	Yates	1,202	1,456	1,509
23	*Lyndonville village*	*738*	*832*	*647*
37	**Oswego county**	**71,045**	**75,929**	**71,664**
01	**Fulton city**	**13,043**	**11,138**	**10,480**
02	**Oswego city**	**23,626**	**25,426**	**23,368**
50	Albion	973	1,120	1,109
20	*Altmar village*	*315*	*390*	*363*
51	Amboy	617	670	736
52	Boylston	545	578	667
53	Constantia	1,248	1,463	1,336
21	*Cleveland village*	*541*	*660*	*687*
54	Granby	1,913	1,928	2,022
55	Hannibal	1,434	1,902	1,818
22	*Hannibal village*	*400*	*432*	*330*
56	Hastings	1,705	1,880	1,886
23	*Central Square village*	*448*	*481*	*429*
57	Mexico	1,488	1,675	1,749
24	*Mexico village*	*1,336*	*1,474*	*1,233*
58	New Haven	1,256	1,476	1,461
59	Orwell	890	924	929
60	Oswego	1,662	3,090	2,671
61	Palermo	1,046	1,281	1,255
62	Parish	789	871	821
25	*Parish village*	*476*	*521*	*490*

* Albion, village, located in two towns, Albion and Gaines. Total shown represents entire population of this village.

† Medina, village, located in two towns, Ridgeway and Shelby. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION		
		United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	OSWEGO COUNTY — (*Concluded*)			
63	Redfield	647	678	803
64	Richland	1,843	2,060	2,003
26	*Pulaski village*	*1,895*	*1,860*	*1,788*
65	Sandy Creek	991	1,181	1,046
27	*Lacona village*	*461*	*476*	*443*
28	*Sandy Creek village*	*566*	*669*	*617*
66	Schroeppel	870	1,494	1,065
29	*Phoenix village*	*1,747*	*1,665*	*1,642*
67	Scriba	1,817	2,260	2,199
68	Volney	1,995	2,420	2,407
69	West Monroe	782	935	915
70	Williamstown	767	861	896
71	Minetto	913	....	....
38	**Otsego county**	**46,200**	**48,534**	**47,216**
01	**Oneonta city**	**11,582**	**10,474**	**9,491**
50	Burlington	999	1,145	1,108
51	Butternuts	964	1,088	998
20	*Gilbertsville village*	*419*	*451*	*455*
52	Cherry Valley	672	782	914
21	*Cherry Valley village*	*728*	*762*	*792*
53	Decatur	422	437	476
54	Edmeston	1,553	1,682	1,567
55	Exeter	814	967	1,067
56	Hartwick	1,648	1,943	1,813
57	Laurens	1,107	1,046	1,211
22	*Laurens village*	*228*	*264*	*242*
58	Maryland	1,003	1,194	1,276
23	*Schenevus village*	*526*	*537*	*576*
59	Middlefield	1,489	1,671	1,901
*24**	*Cooperstown village (65)*	*2,725*	*2,634*	*2,484*
60	Milford	1,111	1,283	1,314
25	*Milford village*	*505*	*560*	*511*
61	Morris	787	901	899
26	*Morris village*	*420*	*466*	*535*
62	New Lisbon	912	976	1,039
63	Oneonta	1,601	1,527	1,307
64	Otego	826	942	1,023
27	*Otego village*	*540*	*579*	*676*
65	Otsego (24)	1,556	1,847	1,851
66	Pittsfield	813	965	917
67	Plainfield	791	873	844
68	Richfield	745	796	709
28	*Richfield Springs village*	*1,388*	*1,623*	*1,503*
69	Roseboom	773	867	885
70	Springfield	1,287	1,506	1,468
71	Unadilla	1,238	1,332	1,367
29	*Unadilla village*	*1,157*	*1,125*	*1,009*
72	Westford	735	773	803
73	Worcester	2,136	2,416	2,185
39	**Putnam county**	**10,802**	**12,767**	**14,665**
50	Carmel	2,299	2,737	2,610
51	Kent	696	854	968
52	Patterson	1,231	1,451	1,536
53	Phillipstown	1,427	1,657	2,031
20	*Cold Spring village*	*1,433*	*935*	*2,549*
21	*Nelsonville village*	*412*	*979*	*765*
54	Putnam Valley	704	992	924
55	Southeast	1,741	1,760	1,986
22	*Brewster village*	*859*	*1,402*	*1,296*

* Cooperstown, village, located in two towns, Middlefield and Otsego. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION		
		United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
41	**Rensselaer county**	**113,129**	**121,330**	**122,276**
01	**Rensselaer city**	**10,823**	**11,210**	**10,711**
02	**Troy city**	**72,013**	**75,488**	**76,813**
50	Berlin	1,305	1,480	1,615
51	Brunswick	2,812	3,010	2,832
52	East Greenbush	1,558	1,559	1,350
53	Grafton	733	948	1,019
54	Hoosick	1,962	2,597	2,783
20	*Hoosick Falls village*	*4,896*	*5,406*	*5,532*
55	Nassau	1,360	1,608	1,586
21	*Nassau village*	*655*	*597*	*529*
56	North Greenbush	1,408	1,383	1,293
57	Petersburg	1,066	1,238	1,238
58	Pittstown	1,819	2,092	2,220
*22**	*Valley Falls village (61)*	*633*	*795*	*835*
59	Poestenkill	1,002	1,134	1,078
60	Sand Lake	1,916	2,140	2,128
61	Schaghticoke (22)	1,499	1,917	1,880
23	*Schaghticoke village*	*568*	*794*	*765*
62	Schodack	2,397	3,064	3,384
24	*Castleton village*	*1,595*	*1,583*	*1,396*
63	Stephentown	1,109	1,287	1,289
43	**Rockland county**	**45,548**	**46,903**	**46,873**
50	Clarkstown	6,779	7,289	7,389
20	*Upper Nyack village*	*538*	*642*	*591*
51	Haverstraw	1,783	1,518	1,297
21	*Haverstraw village*	*5,226*	*5,418*	*5,669*
22	*West Haverstraw village*	*2,018*	*2,330*	*2,369*
52	Orangetown	6,266	5,544	5,935
23	*Grand View-on-Hudson village*	*175*	*335*	*368*
24	*Nyack village*	*4,444*	*4,291*	*4,619*
25	*Piermont village*	*1,600*	*1,481*	*1,380*
26	*South Nyack village*	*1,799*	*1,950*	*2,068*
53	Ramapo	3,625	5,782	5,431
27	*Hillburn village*	*1,112*	*1,017*	*1,090*
28	*Spring Valley village*	*3,818*	*2,804*	*2,353*
29	*Suffern village*	*3,154*	*2,781*	*2,663*
54	Stony Point	3,211	3,721	3,651
44	**St. Lawrence county**	**88,121**	**90,291**	**89,005**
01	**Ogdensburg city**	**14,609**	**14,338**	**15,933**
50	Brasher	1,922	2,270	2,179
51	Canton	3,538	3,779	3,450
20	*Canton village*	*2,631*	*2,624*	*2,701*
31	*Rensselaer Falls village*	*328*	*374*	....
52	Clare	152	358	420
53	Clifton	1,573	1,423	1,674
54	Colton	1,299	1,362	1,499
55	De Kalb	2,117	2,479	2,209
21	*Richville village*	*302*	*316*	*307*
56	Depeyster	806	911	907
57	Edwards	920	803	911
22	*Edwards village*	*577*	*504*	*476*
58	Fine	1,459	1,579	2,234
59	Fowler	1,310	1,493	1,655
60	Gouverneur	1,619	1,852	1,892
23	*Gouverneur village*	*4,143*	*4,164*	*4,128*
61	Hammond	1,098	1,267	1,341
24	*Hammond village*	*409*	*418*	*404*
62	Hermon	883	988	939
25	*Hermon village*	*622*	*607*	*587*

* Valley Falls, village, located in two towns, Pittstown and Schaghticoke. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION		
		United States census, January 1, 1920	State enumeration, June 1, 1915	United States census April 15, 1910
	ST. LAWRENCE COUNTY — (*Concluded*)			
63	Hopkinton	1,244	1,511	1,469
64	Lawrence	1,588	1,782	1,676
65	Lisbon	2,673	3,120	2,981
66	Louisville	1,364	1,476	1,492
67	Macomb	1,055	1,204	1,168
68	Madrid	1,390	1,471	1,457
69	Massena	2,982	2,476	1,855
26	*Massena village*	*5,993*	*4,614*	*2,951*
70	Morristown	1,230	1,306	1,348
27	*Morristown village*	*489*	*479*	*540*
71	Norfolk	3,007	2,770	2,877
*28**	*Norwood village* (77)	*1,808*	*1,879*	*1,993*
72	Oswegatchie	1,597	1,837	2,285
32	*Heuvelton village*	*559*	*556*	....
73	Parishville	1,453	1,678	1,785
74	Piercefield	1,454	1,303	770
75	Pierrepont	1,425	1,579	1,628
76	Pitcairn	646	755	816
77	Potsdam (28)	3,006	3,132	2,757
29	*Potsdam village*	*4,039*	*4,157*	*4,036*
78	Rossie	866	932	981
79	Russell	1,757	1,806	1,842
80	Stockholm	2,437	2,655	2,614
81	Waddington	1,040	1,178	1,157
30	*Waddington village*	*702*	*726*	*731*
45	**Saratoga county**	**60,029**	**62,982**	**61,917**
01	**Saratoga Springs city**	**13,181**	**13,792**	**12,710**
02	**Mechanicville city**	**8,166**	**8,208**	**6,634**
50	Ballston	1,648	1,896	1,542
20†	*Ballston Spa village* (61)	*4,103*	*4,344*	*4,138*
51	Charlton	914	1,080	1,030
52	Clifton Park	1,983	2,391	2,225
53	Corinth	1,120	246	936
21	*Corinth village*	*2,576*	*2,415*	*2,166*
54	Day	473	541	628
55	Edinburg	595	785	793
56	Galway	1,007	1,174	1,093
22	*Galway village*	*94*	*104*	*112*
57	Greenfield	1,481	1,642	1,552
58	Hadley	581	689	672
59	Halfmoon	1,534	1,213	1,742
60	Malta	1,152	1,298	1,285
61	Milton (20)	1,749	1,926	2,135
62	Moreau	1,064	1,134	1,093
24	*South Glens Falls village*	*2,158*	*2,106*	*2,247*
63	Northumberland	1,048	1,120	1,127
64	Providence	462	512	520
65	Saratoga	1,330	1,446	1,580
25	*Schuylerville village*	*1,625*	*1,711*	*1,614*
26	*Victory Mills village*	*725*	*657*	*748*
67	Stillwater (23)	2,900	2,934	2,555
27	*Stillwater village*	*982*	*1,041*	*1,004*
68	Waterford	1,915	2,440	2,883
28	*Waterford village*	2,637	3,047	3,245
69	Wilton	826	1,090	908
46	**Schenectady county**	**109,363**	**98,625**	**88,235**
01	**Schenectady city**	**88,723**	**80,381**	**72,826**
50	Duanesburg	2,115	2,280	2,211

* Norwood, village, located in two towns, Norfolk and Potsdam. Total shown represents entire population of this village.

† Ballston Spa, village, located in two towns, Ballston and Milton. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION: United States census, January 1, 1920	POPULATION: State enumeration, June 1, 1915	POPULATION: United States census, April 15, 1910
	SCHENECTADY COUNTY — (*Concluded*)			
51	Glenville	2,678	2,748	2,244
20	*Scotia village*	*4,358*	*3,790*	*2,957*
52	Niskayuna	3,149	2,607	1,907
53	Princetown	487	621	684
54	Rotterdam	7,853	6,198	5,406
47	**Schoharie county**	**21,303**	**22,005**	**23,855**
50	Blenheim	516	530	616
51	Broome	743	756	933
52	Carlisle	861	963	1,024
53	Cobleskill	1,888	1,508	1,491
20	*Cobleskill village*	*2,410*	*2,362*	*2,088*
54	Conesville	652	681	708
55	Esperance	671	729	714
21	*Esperance village*	*219*	*241*	*263*
56	Fulton	1,227	1,350	1,450
57	Gilboa	1,541	1,420	1,467
58	Jefferson	1,065	1,181	1,280
59	Middleburg	1,123	1,194	1,439
22	*Middleburg village*	*986*	*1,059*	*1,114*
60	Richmondville	797	893	831
23	*Richmondville village*	*581*	*587*	*598*
61	Schoharie	1,281	1,314	1,530
24	*Schoharie village*	*851*	*1,124*	*996*
62	Seward	1,193	1,380	1,419
63	Sharon	1,094	1,250	1,366
25	*Sharon Springs village*	*400*	*531*	*459*
64	Summit	871	1,046	1,105
65	Wright	833	926	963
48	**Schuyler county**	**13,098**	**13,954**	**14,004**
50	Catharine	812	857	892
20	*Odessa village*	*366*	*335*	*330*
51	Cayuta	282	346	345
52	Dix	969	1,154	1,167
*21**	*Watkins village (56)*	*2,785*	*2,760*	*2,817*
53	Hector	2,650	3,173	3,132
22	*Burdett village*	*380*	*375*	*382*
54	Montour	407	395	400
23	*Montour Falls village*	*1,560*	*1,281*	*1,208*
55	Orange	889	982	1,087
56	Reading (21)	898	1,039	959
57	Tyrone	1,100	1,257	1,285
49	**Seneca county**	**24,735**	**25,249**	**26,972**
50	Covert	1,028	1,200	1,254
20	*Interlaken village*	*633*	*663*	*693*
51	Fayette	1,698	1,986	2,030
21†	*Waterloo village (59)*	*3,809*	*4,343*	*3,931*
52	Junius	829	942	957
53	Lodi	1,137	1,399	1,408
54	Ovid	438	1,153	2,807
22	*Ovid village*	*2,417*	*591*	*548*
55	Romulus	2,754	2,098	2,803
56	Seneca Falls	790	613	819
23	*Seneca Falls village*	*6,389*	*7,018*	*6,588*
57	Tyre	798	895	900
58	Varick	1,020	1,273	1,178
59	Waterloo (21)	995	1,075	1,061

* Watkins, village, located in two towns, Dix and Reading. Total shown represents entire population of this village.

† Waterloo, village, located in two towns, Fayette and Waterloo. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed*

District number	COUNTY AND DISTRICT	POPULATION: United States census, January 1, 1920	POPULATION: State enumeration, June 1, 1915	POPULATION: United States census, April 15, 1910
50	**Steuben county**	**80,627**	**83,630**	**83,362**
01	**Corning city**	**15,820**	**13,459**	**13,730**
02	**Hornell city**	**15,025**	**14,352**	**13,617**
50	Addison	423	406	505
20	*Addison village*	*1,699*	*1,754*	*2,004*
51	Avoca	869	1,025	1,063
21	*Avoca village*	*1,019*	*1,083*	*1,057*
52	Bath	1,968	3,428	4,083
22	*Bath village*	*4,795*	*4,173*	*3,884*
23	*Savona village*	*554*	*571*	*587*
53	Bradford	570	629	613
54	Cameron	779	957	1,066
55	Campbell	1,032	1,106	1,204
56	Canisteo	700	1,080	1,182
24	*Canisteo village*	*2,201*	*2,314*	*2,259*
57	Caton	688	1,053	1,078
58	Cohocton	1,742	2,145	2,088
25	*Cohocton village*	*843*	*958*	*838*
59	Corning	2,857	2,580	2,391
60	Dansville	1,031	1,269	1,308
61	Erwin	916	1,150	987
26	*Painted Post village*	*2,170*	*1,319*	*1,224*
62	Fremont	645	812	860
63	Greenwood	941	1,142	1,111
64	Hartsville	545	638	651
65	Hornby	700	842	870
66	Hornellsville	1,366	1,515	2,047
31	*Arkport village*	*463*	*538*	....
67	Howard	1,127	1,386	1,461
68	Jasper	943	1,253	1,264
69	Lindley	1,024	1,181	1,153
70	Prattsburg	1,009	1,102	1,150
27	*Prattsburg village*	*654*	*696*	*684*
71	Pulteney	1,062	1,335	1,316
72	Rathbone	761	869	917
73	Thurston	674	855	840
74	Troupsburg	1,406	1,532	1,712
75	Tuscarora	854	955	1,006
76	Urbana	1,240	1,536	1,405
28	*Hammondsport village*	*1,060*	*1,560*	*1,254*
77	Wayland	1,214	1,400	1,444
29	*Wayland village*	*1,790*	*1,699*	*1,392*
78	Wayne	516	686	643
79	West Union	781	885	985
80	Wheeler	808	892	959
81	Woodhull	1,043	1,158	1,139
30	*Woodhull village*	*300*	*352*	*316*
51	**Suffolk county**	**110,246**	**104,342**	**96,138**
50	Babylon	5,527	5,310	3,913
20	*Amityville village*	*3,265*	*2,780*	*2,517*
21	*Babylon village*	*2,523*	*3,100*	*2,600*
51	Brookhaven	17,191	14,435	12,494
22	*Bellport village*	*614*	*499*	*419*
23	*Patchogue village*	*4,031*	*4,506*	*3,824*
28	*Shoreham village*	*11*	*151*	....
52	Easthampton	3,749	4,018	3,554
*24**	*Sag Harbor village (58)*	*2,993*	*3,245*	*3,408*
32	*Easthampton village*	....	....	....
53	Huntington	11,916	12,717	9,908
25	*Northport village*	*1,977*	*2,527*	*2,096*
54	Islip	20,447	17,658	18,346

* Sag Harbor, village, located in two towns, Easthampton and Southampton. Total shown epresents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION		
		United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	SUFFOLK COUNTY — (*Concluded*)			
29	*Brightwaters village*	*250*	....	....
30	*Saltaire village*	*12*	....	....
55	Riverhead	5,753	5,730	5,345
56	Shelter Island	887	1,155	1,064
31	*Dering Harbor village*	*3*	....	....
57	Smithtown	9,114	4,988	7,073
58	Southampton (24)	6,833	8,262	6,320
26	*Southampton village*	*2,891*	*3,092*	*2,509*
59	Southold	7,025	6,273	7,488
27	*Greenport village*	*3,122*	*3,735*	*3,089*
	Indian Reservation	112	161	171
52	**Sullivan county**	33,163	33,189	33,808
50	Bethel	1,849	2,308	2,164
51	Callicoon	1,739	2,066	2,059
52	Cochecton	1,112	1,141	1,142
53	Delaware	1,740	1,918	1,842
54	Fallsburgh	3,825	4,860	3,782
26	*Woodridge village*	*944*	*900*	....
55	Forestburg	405	429	545
56	Fremont	1,435	1,771	1,931
57	Highland	875	1,043	1,031
58	Liberty	3,571	3,944	3,330
20	*Liberty village*	*2,459*	*2,295*	*2,072*
59	Lumberland	480	806	716
60	Mamakating	2,033	2,695	2,444
21	*Wurtsboro village*	*362*	*409*	*478*
61	Neversink	1,609	1,861	1,743
62	Rockland	3,247	3,803	3,455
63	Thompson	2,267	2,810	2,255
22	*Monticello village*	*2,330*	*2,132*	*1,941*
64	Tusten	881	901	878
53	**Tioga county**	24,212	25,549	25,624
50	Barton	1,476	1,523	1,576
20	*Waverly village*	*5,270*	*5,159*	*4,855*
51	Berkshire	805	875	846
52	Candor	1,940	2,147	2,174
21	*Candor village*	*699*	*749*	*787*
53	Newark Valley	1,068	1,167	1,177
22	*Newark Valley village*	*881*	*808*	*925*
54	Nichols	838	947	933
23	*Nichols village*	*554*	*586*	*533*
55	Owego	2,560	2,896	2,841
24	*Owego village*	*4,147*	*4,570*	*4,633*
56	Richford	831	913	925
57	Spencer	865	552	960
25	*Spencer village*	*661*	*653*	*569*
58	Tioga	1,677	2,004	1,940
54	**Tompkins county**	35,285	36,535	33,647
61	**Ithaca city**	17,004	16,750	14,802
50	Caroline	1,542	1,676	1,646
51	Danby	1,143	1,230	1,235
52	Dryden	2,176	2,497	2,563
20	*Dryden village*	*707*	*728*	*709*
21	*Freeville village*	*303*	*337*	*318*
53	Enfield	867	1,057	1,000
54	Groton	1,887	2,056	2,029
22	*Groton village*	*1,236*	*1,446*	*1,260*
55	Ithaca	1,201	1,203	1,288
23	*Cayuga Heights village*	*179*	....	....

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION		
		United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	TOMPKINS COUNTY — (*Concluded*)			
56	Lansing	2,380	2,612	2,676
57	Newfield	1,154	1,306	1,155
23	*Newfield village*	*302*	*341*	*354*
58	Ulysses	1,094	1,432	1,424
24	*Trumansburg village*	*1,011*	*1,181*	*1,188*
55	**Ulster county**	**74,979**	**85,367**	**91,769**
01	**Kingston city**	**26,688**	**26,354**	**25,908**
50	Denning	419	531	615
51	Esopus	3,564	4,297	3,957
*20**	*Rifton village*	*349*	*346*	*745*
52	Gardiner	1,088	1,328	2,779
53	Hardenburg	420	565	598
54	Hurley	846	1,189	1,734
55	Kingston	166	323	343
56	Lloyd	3,079	2,865	2,803
57	Marbletown	2,017	2,709	4,713
58	Marlborough	2,467	3,513	2,921
21	*Marlboro village*	*807*	*796*	*920*
59	New Paltz	1,107	1,308	1,795
22	*New Paltz village*	*1,056*	*1,261*	*1,230*
60	Olive	1,237	2,921	4,497
61	Plattekill	1,798	1,928	1,879
62	Rochester	2,188	2,715	2,760
63	Rosendale	1,404	2,082	2,592
23	*Rosendale village*	*555*	*804*	*1,125*
64	Saugerties	4,232	5,366	5,703
24	*Saugerties village*	*4,013*	*4,490*	*3,929*
65	Shandaken	2,124	2,090	2,240
25	*Pine Hill village*	*248*	*646*	*417*
66	Shawangunk	2,087	2,392	2,548
67	Ulster	2,622	3,437	3,554
68	Wawarsing	3,794	4,434	4,673
26	*Ellenville village*	*3,116*	*3,073*	*3,114*
69	Woodstock	1,488	1,605	1,647
56	**Warren county**	**31,673**	**32,977**	**32,223**
01	**Glens Falls city**	**16,638**	**16,323**	**15,243**
50	Bolton	1,184	1,397	1,518
51	Caldwell	667	892	850
20	*Lake George village*	*630*	*750*	*632*
52	Chester	1,572	1,630	1,721
53	Hague	1,028	943	1,043
54	Horicon	754	1,056	1,001
55	Johnsburg	2,242	2,358	2,315
56	Luzerne	1,018	1,070	1,185
57	Queensbury	2,584	2,721	2,667
58	Stony Creek	651	719	858
59	Thurman	680	807	805
60	Warrensburg	2,025	2,314	2,385
57	**Washington county**	**44,888**	**46,965**	**47,778**
50	Argyle	1,337	1,451	1,575
20	*Argyle village*	*198*	*223*	*231*
51	Cambridge	1,164	1,179	1,222
21†	*Cambridge village (65)*	*1,559*	*1,787*	*1,528*
52	Dresden	495	514	582
53	Easton	1,520	1,831	1,772
22‡	*Greenwich village (57)*	*2,384*	*2,315*	*2,314*

* Disorganized; reports with town of Esopus.

† Cambridge, village, located in two towns, Cambridge and White Creek. Total shown represents entire population of this village.

‡ Greenwich, village, located in two towns, Easton and Greenwich. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION: United States census, January 1, 1920	POPULATION: State enumeration, June 1, 1915	POPULATION: United States census, April 15, 1910
	WASHINGTON COUNTY — (*Concluded*)			
54	Fort Ann	2,019	1,866	1,800
23	*Fort Ann village*	*338*	*436*	*436*
55	Fort Edward	1,974	2,069	1,978
24	*Fort Edward village*	*3,871*	*3,662*	*3,762*
56	Granville	1,942	2,491	2,514
25	*Granville village*	*3,024*	*3,890*	*3,920*
57	Greenwich (22)	2,215	2,293	2,274
58	Hampton	552	671	645
59	Hartford	1,102	1,171	1,216
60	Hebron	1,184	1,356	1,505
61	Jackson	836	988	985
62	Kingsbury	1,575	1,703	1,891
26	*Hudson Falls village*	*5,761*	*5,585*	*5,189*
63	Putnam	528	579	504
64	Salem	1,152	1,377	1,530
27	*Salem village*	*1,083*	*1,096*	*1,250*
65	White Creek (21)	1,067	1,020	1,286
66	Whitehall	750	796	952
28	*Whitehall village*	*5,258*	*4,666*	*4,917*
58	**Wayne county**	**48,827**	**52,476**	**50,179**
50	Arcadia	2,302	1,716	2,445
20	*Newark village*	*6,964*	*6,468*	*6,227*
51	Butler	1,296	1,568	1,450
*21**	*Wolcott village (64)*	*1,188*	*1,346*	*1,216*
52	Galen	1,644	1,944	1,935
22	*Clyde village*	*2,528*	*2,699*	*2,695*
53	Huron	1,416	1,681	1,531
54	Lyons	1,306	1,453	1,453
23	*Lyons village*	*4,253*	*4,742*	*4,460*
55	Macedon	1,676	1,336	1,819
24	*Macedon village*	*526*	*1,147*	*536*
56	Marion	2,158	2,435	2,102
57	Ontario	2,620	2,934	2,672
58	Palmyra	1,560	1,728	1,901
25	*Palmyra village*	2,480	2,469	2,268
59	Rose	1,928	2,243	1,883
60	Savannah	1,008	1,108	1,065
26	*Savannah village*	*516*	*531*	*521*
61	Sodus	3,079	5,757	4,857
28	*Sodus village*	*1,329*	....	....
62	Walworth	1,997	2,308	2,187
63	Williamson	3,293	3,762	3,060
64	Wolcott (21)	1,263	1,576	1,439
27	*Red Creek village*	*499*	*525*	*457*
59	**Westchester county**	**344,436**	**321,713**	**283,055**
01	**Peekskill village**	**15,868**	**15,502**	**15,245**
02	**White Plains city**	**21,031**	**19,287**	**17,090**
03	**Mt. Vernon city**	**42,726**	**37,583**	**30,919**
04	**New Rochelle city**	**36,213**	**31,758**	**28,867**
05	**Ossining village**	**10,739**	**10,326**	**11,480**
06	**Port Chester village**	**16,573**	**15,129**	**12,809**
07	**Yonkers city**	**100,176**	**90,948**	**79,803**
50	Bedford	4,020	4,777	4,363
20†	*Mt. Kisco village (58)*	*3,944*	*2,902*	*2,802*
51	Cortlandt	2,869	5,045	5,204
21	*Croton-on-Hudson village*	*2,286*	*2,243*	*1,806*
52	Eastchester	2,808	2,565	1,837

* Wolcott village, located in two towns, Butler and Wolcott. Total shown represents entire population of this village.

† Mount Kisco village, located in two towns, Bedford and New Castle. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Continued)

District number	COUNTY AND DISTRICT	POPULATION United States census, January 1, 1920	State enumeration, June 1, 1915	United States census, April 15, 1910
	WESTCHESTER COUNTY — (*Concluded*)			
22	*Bronxville village*	*3,055*	*2,240*	*1,863*
23	*Tuckahoe village*	*3,509*	*2,758*	*2,722*
53	Greenburgh	3,181	4,016	4,685
24	*Ardsley village*	*730*	*442*	*537*
25	*Dobbs Ferry village*	*4,401*	*4,030*	*3,455*
26	*Hastings-on-Hudson village*	*5,526*	*5,461*	*4,552*
27	*Irvington village*	*2,701*	*2,379*	*2,319*
28	*Tarrytown village*	*5,807*	*5,752*	*5,600*
39	*Elmsford village*	*1,535*	*1,380*	....
54	Harrison	5,006	5,081	4,226
55	Lewisboro	1,069	1,507	1,127
56	Mamaroneck	1,797	1,339	230
29	*Larchmont village*	*2,468*	*2,060*	*1,958*
*30**	*Mamaroneck village (64)*	*6,571*	*7,290*	*5,699*
57	Mt. Pleasant	4,482	5,596	3,789
31†	*Briarcliff Manor village (61)*	*1,027*	*1,221*	*950*
32	*North Tarrytown village*	*5,927*	*4,877*	*5,421*
33	*Pleasantville village*	*3,590*	*2,464*	*2,207*
34	*Hillside village*	....	‡	*423*
58	Newcastle (20)	1,580	2,528	2,037
59	North Castle	1,705	2,484	1,522
60	North Salem	934	1,181	1,258
61	Ossining (31)	597	673	421
(62	Pelham)	....	§	154
35	*North Pelham village*	*2,385*	*1,874*	*1,811*
36	*Pelham village*	*1,056*	*793*	*681*
37	*Pelham Manor village*	*1,754*	*1,115*	*852*
63	Poundridge	515	643	725
64	Rye (30)	903	809	594
38	*Rye village*	*5,308*	*5,339*	*3,964*
65	Scarsdale	3,506	2,717	1,300
66	Somers	1,117	1,173	1,228
67	White Plains (02)	**	....	....
68	Yorktown	1,441	2,431	3,020
60	**Wyoming county**	**30,314**	**32,028**	**31,880**
50	Arcade	803	911	837
20	*Arcade village*	*1,609*	*1,568*	*1,294*
51	Attica	728	898	880
21	*Attica village*	*2,015*	*2,013*	*1,869*
52	Bennington	1,557	1,757	1,742
53	Castile	1,010	1,193	1,102
22	*Castile village*	*1,013*	*962*	*1,040*
23‡	*Perry village (61)*	*4,717*	*5,009*	*4,388*
54	Covington	788	981	923
55	Eagle	1,059	1,189	1,141
56	Gainesville	780	1,242	1,389
24	*Gainesville village*	*341*	*340*	*327*
25	*Silver Springs village*	*1,155*	*893*	*974*
57	Genesee Falls	542	661	615
58	Java	1,469	1,636	1,633
59	Middlebury	818	1,485	1,395
28	*Wyoming village*	*386*	....	....
60	Orangeville	838	905	952
61	Perry (23)	950	1,117	1,236
62	Pike	699	732	772

* Mamaroneck, village, located in two towns, Mamaroneck and Rye. Total shown represents entire population of this village.

† Briarcliff Manor, village, located in two towns, Mount Pleasant and Ossining. Total shown represents entire population of this village.

§ Disorganized; including village of Pelham Manor.

** Included in the city of White Plains.

‡ Perry village, located in two towns, Castile and Perry. Total shown represents entire population of this village.

STATE OF NEW YORK (exclusive of New York City): *Population of counties and each primary registration district by censuses of* 1920, 1915 *and* 1910 *with district numbers prefixed* — (Concluded)

District number	COUNTY AND DISTRICT	Population: United States census, January 1, 1920	Population: State enumeration, June 1, 1915	Population: United States census, April 15, 1910
	WYOMING COUNTY — (*Concluded*)			
26	*Pike village*	*304*	*344*	*422*
63	Sheldon	1,593	1,752	1,713
64	Warsaw	774	1,121	1,102
27	*Warsaw village*	*3,622*	*3,424*	*3,206*
65	Wethersfield	744	895	928
61	**Yates county**	**16,641**	**18,841**	**18,642**
50	Barrington	822	1,017	1,044
51	Benton	1,595	1,856	1,821
*20**	*Penn Yan village (55)*	*4,517*	*4,725*	*4,597*
52	Italy	731	823	861
53	Jerusalem	2,025	2,424	2,444
54	Middlesex	951	1,133	1,122
55	Milo (20)	1,502	1,723	1,702
56	Potter	789	1,083	1,156
(*21*)†	*Rushville village (3456)*	*411*	(*331*	*pt. 339*)
57	Starkey	1,239	1,420	1,310
22	*Dundee village*	*1,143*	*1,236*	*1,228*
58	Torrey	621	744	673
23	*Dresden village*	*295*	*326*	*345*

* Penn Yan village, located in two towns, Benton and Milo. Total shown represents entire population of this village.

† See Rushville, Ontario county, for entire population.

NOTE.— The inmates of all institutions (except convents, homes, and orphan asylums) were not tabulated in the enumeration district where such institutions were located, unless they permanently resided in such enumeration district or had no other place of abode. * * *

In 1910 New York State was enumerated by the federal authorities as of April 15. All persons, who were not inmates of institutions, were enumerated and tabulated in the districts where their usual places of abode were situated. All of the inmates and staff of nearly every institution were credited to the enumeration districts where the institutions were situated. In comparing the figures of the 1915 census with those of 1910, and especially in comparing the population of cities and villages where the large institutions are situated, the methods of the two enumerations should be considered. (*Extract from the Secretary of State's Report on the Enumeration of Inhabitants: State of New York*, 1915.)

INDEX

PAGE

Antitoxins, distribution of and record of administration............ 168
Births (see list of Vital Statistics tables, pages 223–226).
Cancer, movement of mortality in the State with annual rates per 100,000 population, 1907–1920.............................. 397
Child Hygiene, report of division.............................. 30
Commissioner of Health, report of.............................. 1
financial statement 4, 5
group consultation clinics 10
letter of transmittal 1
suggestions for legislative action 6
summary of work of divisions.............................. 8
Communicable diseases, report of director.............................. 53
cases by counties, 1920 74
by months for State, New York city and rest of State, 1908–1920 65
cases, deaths, case rates, death rates, case fatality rates by counties, 1920 72
cases, deaths, case rates, death rates, case fatality rates in State, New York city and rest of State, 1908–1920.............................. 62
diphtheria 54
measles 54
sanitary supervisors 57
scarlet fever 54
scoring of city health departments.............................. 61
smallpox 55
typhoid fever 53
whooping cough 55
Deaths (see list of Vital Statistics tables, pages 223–226).
Diphtheria 54
cases by months for State, New York city and rest of State, 1908–1920 66
cases, deaths, case rates, death rates, case fatality rates by counties, 1920 72
cases deaths, case rates, death rates, case fatality rates in State, New York city and rest of State, 1908–1920.............................. 62
deaths, for each city of the State, by broad age groups.......... 264
in each municipality.............................. 326
Infant mortality (see list of Vital Statistics tables, pages 223–226).
Laboratories and Research, report of director.............................. 149
antitoxin, serum and vaccine laboratories.............................. 153
diagnostic examinations 171
summary of, made by approved laboratories............ 179
laboratories 156
diphtheria and tetanus antitoxin 168
distribution of diphtheria and tetanus antitoxins.............................. 168
diagnostic outfits 170
serums, vaccines, etc.............................. 167
executive andsecretarial offices 161
field activities in correlation with other divisions and agencies... 163
library 162
media and glassware, preparation of.............................. 161
media preparation, record of.............................. 178
sanitary analyses 181
water analyses by municipalities 182
and analytical chemical laboratories.............................. 159

PAGE

Marriages (see list of Vital Statistics tables, pages 223–226).
Measles 54
cases by months for State, New York city and rest of State, 1908–1920 68
cases, deaths, case rates, death rates, case fatality rates by counties, 1920 72
cases, deaths, case rates, death rates, case fatality rates in State, New York city and rest of State, 1908–1920 64
deaths, for each city of the State, by broad age groups 264
in each municipality 326
Public Health Council, report of 37–50
amendments to Sanitary Code (Appendix I) 42
Public Health Education, report of division 25
Public Health Nursing, report of division 21
Sanitary code, amendments to, Appendix I 42
Sanitary supervisors 57
scoring of city health departments 61
Scarlet fever 54
cases by months for State, New York city and rest of State, 1908–1920 69
cases, deaths, case rates, death rates, case fatality rates by counties, 1920 72
cases, deaths, case rates, death rates, case fatality rates in State, New York city and rest of State, 1908–1920 63
deaths, for each city of the State, by broad age groups .. 264, 278, 320
in each municipality 326
Scoring of city health departments 61
Smallpox 55
cases 56
deaths for each city of State, by broad age groups 264
State institutions, deaths in, by broad age groups 386
Stillbirths (see list of Vital Statistics tables, pages 223–226)
Tuberculosis, report of division 19
cases by months for State, New York city and rest of State, 1908–1920 67
cases, deaths, case rates, death rates, case fatality rates in State, New York city and rest of State, 1908–1920 63
deaths in each city of the State with annual rates per 100,000 population, 1916–1920 .... 276, 326
in each municipality 326
Typhoid fever 53
cases by months for State, New York city and rest of State, 1908–1920 65
cases, deaths, case rates, death rates, case fatality rates by counties, 1920 72
cases, deaths, case rates, death rates, case fatality rates in State, New York city and rest of State 1908-1920 62
deaths in each city of the State with annual rates per 100,000 population, 1916–1920 274
in each municipality 326
Venereal diseases, report of director 81
admission to clinics 114
arsphenamine distributed 125
clinics public 100
other 109
summary of reports of 116
treatment at 120
drugs 111
educational activities 84
lantern slides 92
list of clinics 140

Venereal diseases — (*continued.*) PAGE
literature, synopsis of.................................... 93
social service work.................................... 134
treatment of gonorrhea.................................... 113
syphilis 110
Vital Statistics, report of division.............................. 219 613
Whooping cough 55
cases by months for State, New York city and rest of State, 1908-1920 70
cases, deaths, case rates, death rates, case fatality rates by counties, 1920 72
cases, deaths, case rates, death rates, case fatality rates in State, New York city and rest of State, 1908-1920.................... 63
deaths, in each city of the State, by broad age groups........... 264
in each municipality.................................... 326

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STATE OF NEW YORK

FORTY-FIRST ANNUAL REPORT

OF THE

STATE DEPARTMENT OF HEALTH

For the Year Ending December 31, 1920

VOLUME II

Report of Division of Sanitary Engineering

ALBANY
J. B. LYON COMPANY, PRINTERS
1921

STATE OF NEW YORK

EXECUTIVE CHAMBER,

ALBANY, *April* 12, 1921.

To the Legislature:

I have the honor to present herewith the forty-first annual report of the State Commissioner of Health for the year 1920.

NATHAN L. MILLER.

NEW YORK STATE DEPARTMENT OF HEALTH

Division of Sanitary Engineering

Chief Engineer	Theodore Horton
Principal Assistant Engineer	Charles A. Holmquist
Assistant Engineer	Henry Ryon
Assistant Engineer	Earl Devendorf
Assistant Engineer	W. W. Young
Assistant Engineer	Alfred Mullikin
Assistant Engineer	Albert I. Howd
Inspecting Engineer	W. C. Emigh
Sanitary Inspector	W. John Erickson
Sanitary Inspector	Jacob H. Weber
Sanitary Inspector	Nathan H. Baier

Resignations During Year

E. Sherman Chase, Assistant Engineer
Charles A. Howland, Assistant Engineer

CONTENTS

PAGE

Report of Chief Engineer 13
I. Sewerage and sewage disposal:
(a) Examination and approval of plans for sewerage and sewage disposal:
Avon 20
Baron de Hirsch Agricultural School (see Cortlandt)
Bedford (Town) (Property of E. O. Holter) 20
Bedford Hills (State Reformatory for Women) 20
Beekman (Town) (Sylvan Lake Camp for Girls) 21
Binghamton 21
Briarcliff Manor (Briarcliff Manor Realty Company) 22
Brighton (Town) (Sewer District No. 1) 22
Bronxville 25
Brookhaven (Town) (Suffolk County Tuberculosis Hospital) 25
Brownville 26
Canaan (Town) (Public School No. 1) 30
Chichester (see Shandaken)
Claverack (Town) (States Metals Company) 31
Clayville Knitting Company Development (see Paris)
Clyde 32
Cobleskill 36
Cobleskill (State School of Agriculture) 37
Columbus (Town) (Phenix Cheese Company) 37
Comstock (Great Meadow Prison) 38
Cortlandt (Town) (Baron de Hirsch Agricultural School) 38
Dunlop America, Limited (see Tonawanda)
Du Pont Fibersilk Company (see Tonawanda)
Easthampton (Town) (Fisheries Products Company) 42
East Rochester 49
Erie County Agricultural Society (see Hamburg
Fisheries Products Company (see Easthampton)
Ghent (Town) (District School No. 3) 49
Great Meadow Prison (see Comstock)
Great Neck Sewer District (see North Hempstead)
Greenport (Town) (District School No. 1) 50
Hamburg 50
Hamburg (Town) (Erie County Agricultural Society) 51
Haverstraw (Town) (Letchworth Village) 52
Hempstead (Town) (District School No. 22) 52
Ideal Rest Sanatorium (see Orwell)
Johnson City 53
Lake Placid 54
Larchmont 54
Leavenworth Institute (see Wolcott)
Letchworth Village (see Haverstraw)
Liberty (Town) (Loomis Sanatorium) 55
Mamaroneck (Town) (Sewer District No. 1) 59
Marcy (Town) (Utica State Hospital) 62
Middleburgh (High School) 68
Middletown (State Homeopathic Hospital) 69
Naples (Steuben Products Company) 69
Newfield (Town) (District School No. 2) 70
New Windsor (Town) (District School No. 1) 71
North Hempstead (Town) (Great Neck Sewer District) 71

I. Sewerage and sewage disposal—*Continued:* PAGE
(a) Examination and approval of plans for sewerage and sewage disposal —*Continued:*
North Hempstead (Town) (Port Washington Sewer District) 72
Nunda (Peck & Pratt Condensed Milk Company) 72
Ogdensburg 74
Orwell (Town) (Ideal Rest Sanatorium) 74
Ossining (Sing Sing Prison) 75
Oyster Bay (Town) (District School No. 12) 75
Paris (Town) (Clayville Knitting Company Development) 76
Peck & Pratt Condensed Milk Company (see Nunda)
Pelham Manor 79
Phenix Cheese Company (see Columbus)
Philadelphia Rubber Works Company (see Tonawanda)
Port Chester 80
Port Washington Sewer District (see North Hempstead)
Rensselaer 80
Rochester (State Hospital) 80
Rye 80
Saranac Lake 85
Scotia 85
Shandaken (Town) (Chichester) 85
Sing Sing Prison (see Ossining)
States Metals Company (see Claverack)
Steuben Products Company (see Naples)
Stony Point (Town) (Tompkins Cove High School) 93
Suffolk County Tuberculosis Hospital (see Brookhaven)
Sylvan Lake Camp for Girls (see Beekman)
Syracuse 93
Thiells (see Haverstraw)
Tompkins Cove High School (see Stony Point)
Tonawanda (Town) (Dunlop America, L mited) 98
Tonawanda (Town) (Du Pont Fibersilk Company) 99
Tonawanda (Town) (Philadelphia Rubber Works Company) 101
Tuckahoe 103
Union 103
Utica State Hospital (see Marcy)
Waterford (State Commission of Highways) 107
Watertown 107
Wolcott (Town) (Leavenworth Institute and Wolcott High School) .. 107
Individual permits 108
(b) General investigations relating to sewerage and sewage disposal:
East Syracuse 111
Glens Falls 115
Green Island 120
Malta (Town) 122
Oneonta 125
Round Lake Association (see Malta)
Woodridge 127
List of other investigations 130
II. Protection of public water supplies:
(a) Enactment and enforcement of rules and regulations for the protection of public water supplies:
Monroe 134
Peekskill (amended) 137
Stamford 141
(b) Inspections of violations of rules and regulations for the protection of public water supplies 146
(c) Annual reports of local officers on enforcement of rules and regulations for the protection of public water supplies 147
(d) Water supplies used for drinking and culinary purposes by common carriers in interstate traffic 149

II. Protection of public water supplies—*Continued:* PAGE
(e) Investigation of public water supplies:
Akron 152
Albany 153
Albion 168
Amenia 169
Amityville 170
Antwerp 173
Ardsley (see North Tarrytown)
Babylon 173
Baldwin 174
Baldwinsville 175
Bayport (see Patchogue)
Bayshore (see Patchogue)
Bedford Hills (State Reformatory for Women) (plans) 176
Bellrose (see Jamaica)
Berlin 176
Berne (Camp Orinsekwa) 177
Blue Point (see Patchogue)
Binghamton 177
Bridgehampton 177
Buffalo 178
Cadosia 183
Callicoon 184
Canton 185
Castleton 187
Central Islip (State Hospital) (plans) 188
Chatham 188
Cincinnatus 189
Cobleskill (State Agricultural School) (plans) 190
Cohoes 190
Collins (Gowanda State Homeopathic Hospital) (plans) 192
Colonie 192
Conifer 194
Consolidated Water Company of Suburban New York (see North Tarrytown)
Coxsackie 194
Davenport 196
Deferiet 197
Defreestville 198
Delanson 200
Deposit 202
Dobbs Ferry (see North Tarrytown)
Dobbs Ferry (Palmine Company Inc) 203
Easthampton 204
East Islip (see Patchogue)
East Quogue (see Quogue)
East Worcester 205
Elizabethtown 206
Endicott 207
Farmingdale 208
Fishers Island 209
Floral Park (see Jamaica)
Freeport 210
Fulton 210
Fulton Chain (see Thendara)
Garden City 211
Garnerville 212
Glen Cove 214
Glens Falls 214
Goshen 216
Goshen (High School and Public School) 217
Gouverneur 218

II. Protection of public water supplies—*Continued:* PAGE
(e) Investigation of public water supplies—*Continued:*
Gowanda State Homeopathic Hospital (see Collins)
Great Bear Spring Water.................................... 219
Great River (see Patchogue)
Great South Bay Water Company (see Patchogue)
Green Island.................................... 220
Greenport.................................... 221
Greenwich.................................... 222
Guilford.................................... 224
Hamden.................................... 225
Hammondsport.................................... 226
Hancock.................................... 227
Harrison (see Mount Vernon)
Hastings (see North Tarrytown)
Haverstraw.................................... 228
Hempstead.................................... 229
Herring (see Deferiet)
Hicksville.................................... 230
Highland Falls.................................... 230
Hilburn.................................... 231
Hillview.................................... 232
Hinsdale.................................... 233
Holland.................................... 234
Holley.................................... 235
Hollis (see Jamaica)
Horseheads.................................... 237
Hudson.................................... 239
Huntington.................................... 240
Iroquois (Thomas Indian School) (plans).................................... 240
Islip (see Patchogue)
Jamaica Water Supply Company.................................... 241
Jeffersonville.................................... 241
Johnson City.................................... 243
Keeseville.................................... 244
Kings Park (State Hospital) (plans).................................... 245
Lake Placid.................................... 245
Laurelton (see Jamaica)
Livingston Manor.................................... 246
Lockport.................................... 247
Long Beach.................................... 249
Long Eddy.................................... 250
Mamaroneck (see Mount Vernon)
Manhasset.................................... 251
Marcy (Utica State Hospital) (plans).................................... 252
Massena.................................... 252
Mechanicville.................................... 253
Medina.................................... 255
Merrick.................................... 257
Mexico.................................... 258
Middleport.................................... 259
Middletown.................................... 260
Middleville.................................... 262
Millerton.................................... 264
Mineola.................................... 265
Monticello.................................... 265
Morrisville.................................... 267
Mount Vernon (New York Interurban Water Company).................................... 267
New Berlin.................................... 269
New Hyde Park (see Jamaica)
New York Interurban Water Company (see Mount Vernon)
Niagara Falls.................................... 270
North Bangor.................................... 271

II. Protection of public water supplies—*Continued:* PAGE
(e) Investigation of public water supplies—*Continued:*
North Tarrytown.......... 272
North Tonawanda.......... 275
Ocean Beach.......... 275
Ossining (Sing Sing Prison) (plans).......... 275
Owego.......... 275
Oxford.......... 276
Oxford (Women's Relief Corps Home).......... 277
Oyster Bay.......... 277
Patchogue.......... 278
Peekskill.......... 279
Petersburg.......... 280
Phoenicia.......... 281
Phoenix.......... 282
Pine Plains.......... 282
Plattsburg.......... 283
Point O'Woods.......... 284
Port Henry.......... 284
Port Jefferson.......... 285
Port Jervis.......... 286
Port Washington.......... 287
Poughkeepsie.......... 287
Poughkeepsie (Hudson River State Hospital) (plans).......... 288
Prattsburg.......... 288
Promised Land.......... 289
Queens County Water Company.......... 290
Quiogue (see Quogue)
Quogue.......... 291
Red Hook.......... 291
Rensselaer.......... 292
Rhinebeck.......... 293
Richmond Hill (see Jamaica)
Richmondville.......... 293
Riverhead.......... 294
Rockville Center.......... 295
Roosevelt.......... 296
Roscoe.......... 297
Roslyn Water Company.......... 298
Rouses Point.......... 298
Sag Harbor.......... 299
Saltaire.......... 299
Saratoga Springs.......... 300
Saratoga Springs (Bottled Water).......... 301
Saugerties.......... 304
Sayville (see Patchogue)
Scarsdale (see North Tarrytown)
Schenectady.......... 304
Schenectady County Tuberculosis Sanatorium.......... 308
Schenevus.......... 309
Schoharie.......... 310
Schroon Lake.......... 310
Sea Cliff.......... 311
Seneca Falls.......... 312
Sharon Springs.......... 313
Shelter Island Heights.......... 314
Sidney.......... 315
Sodus Point.......... 316
Sonyea (Craig Colony for Epileptics) (plans).......... 316
Southampton.......... 317
South New Berlin.......... 317
Springfield (see Jamaica)
Spring Valley.......... 318

II. Protection of public water supplies—*Continued:* PAGE
(e) Investigation of public water supplies—*Continued:*
Staatsburg 319
Stillwater (Public School) 319
Stony Point (see Haverstraw)
Suffern 320
Summitville 321
Tannersville 322
Thendara (Fulton Chain) 322
Thiells (Letchworth Village) (plans) 323
Thompson 323
Tonawanda 323
Valatie 324
Valley Junction 324
Wappingers Falls 325
Wassaic 326
Waterloo (Memorial Hospital) 327
Wellsville 327
Westbury 328
Western New York Water Company (see Niagara Falls)
Westhampton Beach (see Quogue)
West Haverstraw (see Haverstraw)
West Haverstraw (State Hospital for the Care of Crippled and Deformed Children) (plans) 328
West Sayville (see Patchogue)
Windsor 329
Wolcott 330
Worcester 330
Youngstown 331
III. Investigation of complaints relating to stream pollution:
Boonville 335
Canandaigua 338
Chaumont 345
Hobart 348
Pennellville (see Schroeppel)
Schroeppel (Town) 352
List of other investigations 354
IV. Investigation of public nuisances not arising from stream pollution:
Clayton 357
Newark (Commonwealth Chemical Corporation) 359
Ossining 362
Pelham (Knickerbocker Ice Company) 363
Pelham (Westchester Chemical Company) 365
Poughkeepsie (Town) (Knauss Brothers) 367
Rome (Rome Gas, Electric Light and Power Company) 370
Savannah (Shefford Cheese Company, Inc.) 372
List of other investigations 375
V. Special investigations:
(a) Investigation of sanitary condition of State institutions:
Albion (Western House of Refuge for Women) 379
Batavia (State School for the Blind) 381
Bath (State Soldiers and Sailors' Home) 382
Beacon (Matteawan State Hospital) 383
Bedford Hills (State Reformatory for Women) 384
Binghamton (State Hospital) 386
Buffalo (State Institute for the Study of Malignant Diseases) 388
Central Islip (State Hospital) 388
Collins (Gowanda State Homeopathic Hospital) 390
Comstock (Great Meadow Prison) 392
Dannemora (Clinton Prison and Dannemora State Hospital) 395
Farmingdale (State Institute of Applied Agriculture) 397
Fire Island (State Park) 399
Industry (State Agricultural and Industrial School) 400

V. Special investigations—*Continued:*
(a) Investigation of sanitary condition of State institutions—*Concluded:* PAGE
Iroquois (Thomas Indian School) 401
Kings Park (State Hospital) 403
Middletown (State Homeopathic Hospital) 404
Morrisville (State School of Agriculture) 406
Napanoch (Eastern New York Reformatory) 407
Newark (State School for Mental Defectives) 409
Ogdensburg (St. Lawrence State Hospital) 410
Oxford (State Women's Relief Corps Home) 411
Poughkeepsie (Hudson River State Hospital) 413
Raybrook (State Hospital for Treatment of Incipient Pulmonary Tuberculosis) 414
Rochester (State Hospital) 416
Sonyea (Craig Colony for Epileptics) 417
Thiells (Letchworth Village) 419
West Haverstraw (State Hospital for the Care of Crippled and Deformed Children) 421
Willard (State Hospital) 423
(b) Investigation of sewage disposal plants:
Altamont 425
Cortlandt (Town) (Valeria Home) 429
Newark 430
Pleasantville (Hebrew Sheltering Guardian Society) 434
Rensselaer County Tuberculosis Hosp tal 437
Round Lake Association (see section I b)
Schenectady County Tuberculosis Hospital 439
List of other investigations 444
(c) Investigation of milk pasteurizing plants 445
(d) Mosquito extermination:
Nassau County 454
(e) Other special investigations 464

REPORT OF CHIEF ENGINEER

HERMANN M. BIGGS, M. D., *Commissioner of Health, Albany, N. Y.:*

DEAR SIR.— I have the honor to submit herewith the annual report of the Division of Sanitary Engineering for 1920.

The work of the Engineering Division for 1920 reflects in a general way the same characteristics that have been apparent in nearly every professional and industrial field, namely, an unusual activity in almost every line of work and under trying conditions of professional employment. This situation is, of course, a direct outcome of war conditions, and until sanitary engineers with training and experience essential to the work of the Engineering Division can be more readily obtained within the appropriations granted by the Legislature, or until present unusual demands upon our resources resulting from inactivity during the war has been reduced to normal, there will undoubtedly be little relief from these difficulties.

The activities of the Engineering Division, briefly stated, include the examination and approval of plans for sewerage systems and sewage disposal works; supervision of the sanitary quality of the public water supplies of the State; the investigation of major public nuisances generally, and specifically when called upon under order from the Governor; the examination and reports of the sanitary conditions of state institutions; the supervision of construction and operation of milk pasteurizing plants; the examination and approval of plans and budgets for Nassau County Mosquito Extermination Commission; advice to and approval of plans for water supplies and sewage disposal systems of county tuberculosis hospitals; the investigation of waterborne outbreaks of typhoid fever; consulting advice to municipalities, corporations, and individuals in regard to all phases of sanitary engineering work; and educational and research work so far as these were possible within limited resources.

The work of the Engineering Division for 1920 may perhaps be most clearly and briefly presented in the following list, which

includes numerically the work performed by the Division according to its more important subdivisions and also includes for purposes of comparison the figures for the year 1919.

	1919	1920
Letters and other correspondence referred to Division	2,666	3,020
Letters and reports sent out	4,323	4,444
Plans examined and reported upon	125	127
Investigations of public water supplies	154	193
Investigations of sanitary conditions of state institutions	14	30
Investigations of sewage disposal plants	17	16
Investigations relating to sewerage systems	10	13
Investigations of milk pasteurizing plants	403	166
Investigations of stream pollution and nuisances	47	68
Conferences held with local officials	328	357
Lectures and addresses by staff	6	7

Among those features of the work of the Division during 1920 which may be considered as of more than usual interest or importance may be mentioned, first, the special investigation of the sanitary conditions of certain public gathering places in the State, more particularly the some fifty camps in the Palisades Interstate Park reservation in which some 75,000 boys and girls congregate during the summer months; and the some eighty county and other fair grounds in the State where more than 1,500,000 persons congregate during the fair season. The questions of pure water supplies and sanitary methods of garbage and sewage disposal at these camps and fair grounds are obviously matters of fundamental importance, and the investigations and reports have been directed toward determining wherein and to what extent these various features are defective or insanitary and have concluded with certain definite recommendations that should be followed in order that these camps and fair grounds may be placed in proper sanitary condition.

Another feature of importance in the work of the Division has been the special investigation and consulting advice to the Depart-

ment of the State Engineer and Surveyor and the Department of Architecture in connection with new or increased water supplies and sewage disposal systems for new state institutions or extensions of existing institutions. These relate to the new state hospital for the insane at Marcy, the new Wingdale prison, and extensions to the state hospitals at Beacon, Gowanda, Rome, and Raybrook.

Other investigations having a very important bearing upon the public health of the State include a special investigation and action by the department in the protection of public water supplies of the State against contamination by impure auxiliary or industrial fire supplies, in connection with which a number of typhoid fever outbreaks have occurred during the past few years; and a special investigation and epidemiological studies in connection with certain outbreaks of water-borne diseases other than typhoid fever, a number of which have also occurred in the State during the past few years.

In the field of research work and advancement of engineering knowledge generally may be mentioned practical experiments in the purification of oysters; development of new types and designs in screens and tanks for the purification of sewage; practical experiments in the sedimentation of sewage at Syracuse in connection with its problem of sewage disposal; and practical experiments and full sized installations of apparatus and methods for deodorizing and eliminating objectionable waste gases and odors from certain industrial establishments at Edgewater, N. J., which have been the source of serious nuisance to a large residential section of New York city.

Owing to serious difficulties experienced during the past few years in securing properly trained and experienced engineers, and to many resignations of men called to more lucrative positions in the consulting and industrial field, attention cannot be too strongly focused upon the necessity of financial relief if the volume and efficiency of the work in past years is to be maintained. As a step toward relief in this direction, and in order to improve the conditions of employment generally and make them more comparable and uniform with other engineering departments

of the state service, a uniform classification of positions in the Division with commensurate salaries has been asked of and approved by the Civil Service Commission. If this new classification with necessary appropriations is approved by the Legislature, the present serious handicaps to efficiency of work and integrity of organization will be largely removed.

Respectfully submitted

THEODORE HORTON

Chief Engineer

December 31, 1920

SEWERAGE AND SEWAGE DISPOSAL

EXAMINATION AND APPROVAL OF PLANS FOR SEWERAGE AND SEWAGE DISPOSAL

The examination of plans for sewerage and sewage disposal for municipalities under the provisions of the Public Health, Village, and Town Laws, which require that all such plans be submitted to this Department for approval before construction may be undertaken, comprises one of the more important routine duties of the Engineering Division. Plans for new sewerage and sewage disposal systems are carefully studied not only with reference to the details of the design and the adequacy of these systems but also with respect to the location of the outlets and the extent of the treatment of the sewage in order that not only the municipalities themselves but lower riparian owners and municipalities may have their public water supplies protected and free from any nuisance arising from sewage pollution.

During the year 1920 some 127 sets of plans for sewers, sewerage systems, and sewage and waste disposal have been examined and reported upon by the Engineering Division. Brief descriptions of the different plans recommended for approval, together with the permits issued in connection with their approval and complete reports upon the examinations of the plans for the more important installations proposed, are given below.

AVON

Plans for a proposed sewer extension in Rochester street, in the village of Avon, were approved on April 1, 1920. The permit issued in connection with the approval of these plans contained, in addition to the usual revocation, modification, complete construction, and storm water clauses, the following condition:

That a manhole be constructed at the junction of the lower end of the proposed 6-inch sewer with the existing 6-inch sewer.

BEDFORD (Town) (Property of E. O. Holter)

On March 9, 1920, plans were approved for a sewage disposal plant consisting of a settling tank, dosing chamber, and subsurface irrigation system to treat the sewage from a cottage on the property of Mr. E. O. Holter. Since the property is located on the watershed of Croton lake, one of the sources of water supply of New York City, the plans were submitted to the Department of Water Supply, Gas and Electricity of the city of New York for approval, and were approved by that Department on March 1, 1920. The permit issued by this Department in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to Mr. E. O. Holter to discharge the effluent from the proposed sewage disposal plant to serve the cottage on his property in the town of Bedford into the ground waters of the State tributary to Croton lake, within the town of Bedford, Westchester county, in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.
4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal works.
5. That no sewage sludge from any part of the disposal works shall be discharged into Croton lake or any tributary thereof, or any other water course, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.
6. That when necessary the sludge shall be removed from the proposed tank in such a manner as to cause no nuisance and disposed of by burying in some remote place.

M. NICOLL, JR.

March 9, 1920 — *Deputy State Commissioner of Health*

BEDFORD HILLS (State Reformatory for Women)

Plans submitted by the State Architect for certain repairs and improvements to the sand filters and surrounding embankments at the sewage dis-

posal plant of the New York State Reformatory for Women at Bedford Hills were approved on April 7, 1920. Amended plans for repairs to the sewage disposal plant were approved on July 9, 1920.

BEEKMAN (Town) (Sylvan Lake Camp for Girls)

Plans were approved on June 11, 1920, for 3 separate sewage disposal plants, each consisting of a settling tank and leaching cesspool, for the disposal of sewage from the Sylvan Lake Camp for Girls at Sylvan lake, in the town of Beekman. The permit issued in connection with the approval of these plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to The Hopewell Realty Company to discharge sanitary sewage from the underdrainage of leaching cesspools at Sylvan Lake Camp for Girls, near Beekman, into the ground waters tributary to Sylvan lake, within the town of Beekman, Dutchess county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That sewage disposal plants serving the easterly and westerly wash-houses shall be removed at least 100 feet farther east and west respectively from the points shown on the plan.
2. That the sewage disposal plant to serve the kitchen and mess hall shall either be located not less than 400 feet west of the kitchen and mess hall, or that the sewage from the kitchen be discharged into the sewer or sewage disposal plant serving the westerly wash-houses.
3. That additional leaching cesspools shall be installed whenever required, or some other suitable method of disposal of the sewage from this camp shall be provided when required under plans which must first be submitted to and receive the approval of the State Commissioner of Health.
4. That the sludge shall be buried or otherwise disposed of without nuisance, and that no sludge shall be discharged into any stream or body of water or upon the surface of the ground where it might be carried by rain or melting snow into such stream or body of water.

M. NICOLL, JR.
June 11, 1920 *Deputy State Commissioner of Health*

BINGHAMTON

Plans were approved on June 28, 1920, for proposed sewers in North Way street, Stowe driveway, and Stowe avenue, in the city of Binghamton. The permit issued in connection with the approval of these plans contained, in addition to the usual storm water and complete construction clauses, the following condition:

That whenever required by the State Commissioner of Health the sewage to be collected by the proposed sewer extensions shall be conveyed to and treated in sewage disposal works to be constructed by the city of Binghamton to care for the entire sanitary sewage of the city under plans to be submitted to and approved by this Department.

BRIARCLIFF MANOR (Briarcliff Manor Realty Co.)

Plans were approved on February 21, 1920, for proposed extensions to the temporary sewage disposal plant serving the village of Briarcliff Manor. The plans contemplated the installation of an additional pump and the construction of a new absorption field. The permit issued in connection with the approval of the plans follows. On October 25, 1920, the time limit specified in the permit was extended from October 31, 1920, to October 31, 1921.

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to The Briarcliff Manor Realty Co. to discharge the effluent from the proposed addition to the disposal plant serving Briarcliff Manor into the ground waters of the State tributary to Pocantico river at the point shown on the plan within the municipality of Briarcliff Manor, Westchester county, in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That this permit shall expire on October 31, 1920.
4. That after October 31, 1920, the sewage to be disposed of on the temporary absorption field provided for by the plans approved this day shall be disposed of in accordance with plans heretofore approved by this Department.
5. That the proposed additional disposal works provided by the plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereto and that no portion of the absorption trenches shall be less than 200 feet from the Pocantico river.
6. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal plant.
7. That no sewage or sewage sludge from any part of the disposal works shall be discharged or allowed to flow into the Pocantico river or any other watercourse, or be deposited on the ground where it may be washed by rain or melting snow into any watercourse.

M. NICOLL, JR.

February 21, 1920 *Deputy State Commissioner of Health*

BRIGHTON (Town) (Sewer District No. 1)

On January 7, 1920, plans were approved for altering and enlarging the sewage disposal plant which serves Sewer District No. 1 in the town of Brighton, Monroe county. The report upon the examination of the plans and the permit issued in connection with the approval of the plans follow:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on the examination of plans for altering and enlarging the sewage disposal plant to serve Sewer District No. 1 in the town of Brighton, Monroe county, N. Y., submitted to this Department for approval by the engineer on December 29, 1919.

According to the records of this Department, plans for a disposal plant to serve Sewer District No. 1 were originally approved by this Department on August 29, 1914. At that time the district comprised about 120 acres and the ultimate future population of this area was estimated at 1,940. The plant consisted of a pumping station, a two-story settling tank, a dosing chamber, and intermittent sand filter beds. The settling compartment of the tank had a capacity of 14,000 gallons and the sludge compartment an available capacity of 1600 cubic feet. The area of the sand beds was 1.3 acres. The plant was considered to have a sufficient capacity easily to care for the sewage of 1,000 persons.

On August 6, 1919, plans for certain extensions to the sewerage system for Sewer District No. 1 to serve a new area recently added to the district were submitted to this Department for approval. The new area added has an area of 135 acres and an estimated future population of 2,505 persons, making the estimated future population of the entire district 4,445 persons. It was stated, however, at the time the plans were submitted, that the entire population of this district was then not over 100. The plans for the extensions to the sewerage system, including a necessary pumping station, were approved on August 12, 1919, with the condition that on or before January 1, 1920, additional plans for additions to the existing sewage disposal plant should be submitted to this Department for approval, and that before the population of the district should exceed 1,000 these additions should be constructed and put in operation.

The plans now submitted contemplate the construction of a new settling tank and dosing chamber to be used in connection with the old tank, the abandonment of the present dosing chamber, and the replacement of the present sand beds and sludge bed with larger sand filter beds and a larger sludge bed. The sewage from the pumping station will be discharged into a trough connecting the old and new settling tanks, flow through the two tanks which are connected in parallel, and discharge into the new dosing chamber lying between them, from which it will be distributed by 4 automatic siphons on to the sand beds. The effluent from the sand beds will discharge into the creek which receives the effluent from the present plant.

The proposed new two-story settling tank is to be of concrete, 19 feet by 28 feet in plan, and 24 feet 6 inches deep from the flow line to the bottom of the 3 hoppers forming the bottom of the tank. The settling compartment is separated from the remainder of the tank by 6-inch longitudinal concrete partitions the lower part of which slope toward a central longitudinal slot with an inclination of 1.2 on 1. This slot is protected by a beam of triangular cross section overlapping the slot by 12 inches on each side, and allowing an 8-inch opening on each side through which the solids settling out of the sewage may fall into the sludge compartment. The slope of the sides of the triangular beam are only 0.8 on 1, and it would seem desirable that this slope be made at least equal to that of the partitions in order to avoid clogging of the slots by the accumulations of sludge on the top of the triangular beam. Gas vents 3 feet wide connected to the sludge compartment extend the entire length of the tank on each side. The sewage enters and leaves the tank over wrought-iron weirs extending the full width of the settling compartment at each end. The outlet weir is protected by a wooden scum board set 12 inches from the weir and extending from 2 inches above to 2 feet 6 inches below the surface of the liquid in the tank. Three 8-inch sludge pipes, one extending to the bottom of each hopper, provide a means for drawing off the sludge and discharging it on to the sludge bed.

The capacity of the settling compartment is approximately 30,000 gallons, and the available capacity of the sludge compartment about 2,400 cubic feet. Since this tank is to be operated in connection with the old tank, the total settling capacity available will be 44,000 gallons, and the available sludge capacity 4,000 cubic feet. Assuming a sewage flow of 100 gallons per capita per day, and that the desirable average detention period for fresh dilute sewage such as will be received here is about 2.5 hours flow, the tanks should serve satisfactorily about 4,000 people. With this population the sludge capacity would be about 1 cubic foot per capita which generally proves sufficient.

The dosing chamber is a covered concrete tank 15 by 26 feet in plan having an available depth of about 4 feet. The capacity of the chamber is 11,600 gallons, or 1,650 cubic feet, the equivalent of about 35 minutes average flow or a depth of approximately ½ inch on one sand bed. This capacity could be undoubtedly increased with advantage, for the quantity dosed at each discharge is scarcely sufficient to produce a uniform distribution on the entire sand bed. The capacity of the dosing tank should be increased sufficiently to provide a dose equivalent to not less than one inch over the surface of one sand filter bed, and the size of the siphons increased to 14 inches in order to secure a uniform distribution of the sewage over the beds. Four 10-inch automatic siphons are provided to arrange to distribute the contents of the dosing chamber on to each of the 4 sand beds in turn.

Four sand beds of irregular shape are provided each having an area of about 0.86 of an acre. The filtering material consists of 36 inches of sand having an effective size between the limits of 0.2 m.m. and 0.5 m.m. placed on a 6-inch layer of gravel. The effluent from the dosing chamber is distributed on the beds by means of wooden troughs 12 inches deep and varying from 12 inches to 6 inches in width. Lines of 6-inch drain tile with ¼-inch open joints, laid 10 feet on centers in the gravel on the bottom of the beds, collect the effluent and conduct it to a 10-inch main underdrain which discharges into the creek.

The total area of the sand beds is about 3.5 acres, providing sufficient area to care for a population of approximately 3,500 people, a little less than the population that can be readily cared for by the tanks and about 80 per cent of the estimated future population of the area. According to the report of the engineer, it is expected that within a short time, and long before the population reaches that just mentioned, the district will be taken into the city of Rochester, and other provisions made for the disposal of the sewage.

In view of the above, and after a careful consideration of the essential features of the design and of local and general conditions, I would recommend that the plans be approved, and a permit issued allowing the discharge of the effluent from the proposed sewage disposal plant for Sewer District No. 1, town of Brighton, Monroe county, N. Y., into Allen creek within the town of Brighton, with the following condition in addition to the usual revocation and modification clauses:

1. That the capacity of the proposed dosing tank shall be increased sufficiently to provide for a dose equal to a depth not less than one inch on each sand filter bed.
2. That the size of the siphons be increased to 14 inches.
3. That before the flow of sewage tributary to the proposed sewage disposal plant shall exceed that contributed by 3,600 persons, the proposed sewage disposal plant shall be modified or extended in accordance with plans which must first be submitted to and receive the approval of the State Department of Health and put in operation.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *January* 3, 1920 *Chief Engineer*

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 77 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Sewer Commissioners of Sewer District No. 1, of the town of Brighton, Monroe county, N. Y., to discharge effluent from the proposed sewage disposal plant to serve Sewer District No. 1, town of Brighton, into the waters of Allen creek at the points shown on the plans within the town of Brighton in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.
4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers.
5. That no sewage sludge from any part of the disposal works shall be discharged into Allen creek or any other watercourse or be deposited on the surface of the ground where it might be washed by rain or melting snow into Allen creek or any other watercourse.
6. That the capacity of the proposed dosing tank shall be increased sufficiently to provide for a dose equal to a depth not less than one inch on each sand filter bed.
7. That the size of the siphons be increased to 14 inches.
8. That before the flow of sewage tributary to the proposed sewage disposal plant shall exceed that contributed by 3,600 persons the proposed sewage disposal plant shall be modified or extended in accordance with plans which must first be submitted to and receive the approval of the State Department of Health, and put in operation.

M. NICOLL, JR.

January 7, 1920 *Deputy State Commissioner of Health*

BRONXVILLE

Plans were approved on January 19, 1920, for the proposed reconstruction of the sewer extending from the south end of Meadow avenue across private property to Kraft avenue, in the village of Bronxville. No permit was issued in connection with the approval of these plans.

BROOKHAVEN (Town) (Suffolk County Tuberculosis Hospital)

Amended plans for the disposal of sewage from the Suffolk County Tuberculosis Hospital, near Holtsville, were approved on December 8, 1920. The plans provided for the construction of a new settling tank and the addition of one cesspool to each battery of cesspools. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by article V of the Public Health Law, permission is hereby given to the Board of Managers of the Suffolk County Tuberculosis Hospital to discharge effluent from the proposed disposal plant into the ground waters tributary to Patchogue creek within the town of Brookhaven, Suffolk county, N. Y., in accordance with the plans accompanying the application, under the following conditions:

1. That an ample overflow aperture be provided through the sludge wall nearest the outlet in the treatment tank.

2. That with the exception of the foregoing condition, the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.

3. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal works.

4. That when necessary the sludge shall be removed from the proposed tank, at least once a year, in such a manner as to cause no nuisance and disposed of by burying in some remote place.

5. That whenever required by the State Commissioner of Health, satisfactory detailed plans for additional works for treatment of the sewage of the hospital shall be submitted for approval; and upon the approval of said plans any or all portions of such additional or supplementary works for treatment of sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.
December 8, 1920 *Deputy State Commissioner of Health*

BROWNVILLE

Plans were approved on December 14, 1920, for a proposed sewer system and disposal plant for the village of Brownville, Jefferson county. The report upon the examination of the plans and the permit issued in connection with the approval of the plans follow:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I wish to submit the following report on our examination of the plans for the proposed sewer system and disposal plant for the village of Brownville, Jefferson county, N. Y., submitted to this Department for approval by the consulting engineer for the board of trustees on December 9, 1920. The plans were submitted in duplicate, and were accompanied by an engineering report, specifications, and an application for the approval of the plans and the issuance of a permit. An application asking for permission to omit temporarily the construction of the disposal plant and certain portions of the proposed sewer system was also submitted.

Brownville was incorporated in 1828, and had a population of 854 in 1910 and 998 in 1920. It is located on the Black river, about 4 miles below Watertown, at a point on the north bank of the Black river about 4 miles above where it discharges into Black River bay, an arm of Lake Ontario. The village of Dexter, which has a population of 1,200 people, is located near the mouth of the river, and is the only populous settlement on the river below Brownville. The Black river is not used as a source of public water supply below the village, and a number of municipalities, including the city of Watertown, are at present discharging untreated sewage into this stream above the village. Brownville has at present neither a public water supply nor a sewerage system.

The plans now under consideration were previously submitted on December 1, 1920, and were returned the following day, with a request for additional information on certain points and suggestions for amendments along the following lines:

1. That sewers be shown on all streets.
2. That railroad and brook crossings and drop manholes be shown in detail.
3. That slopes giving low velocities be increased.
4. That the sludge compartment in the treatment tank of the disposal plant be enlarged.

5. That certain other modifications be made in the disposal plant.

A number of conferences with the designing engineer were also held at the office of the Engineering Division of this Department at which other revisions in the plans were suggested.

The plans now submitted have been amended in general accordance with our recommendations, and the information requested is also given. The plans are comprehensive, and show by contour map embracing the village limits that all portions of the village may be made tributary to the sewer system, and sewers are shown on all present and proposed streets. Although it is planned to discharge temporarily the sewage to be collected by the proposed system directly into the Black river through a submerged outlet at the foot of Storehouse alley, the plans submitted include detailed plans for the preliminary treatment of the sewage of the village, and show location of supplementary treatment works to be constructed and put in operation whenever required or necessary. A copy of the deed of the property purchased by the village for the proposed disposal plant was submitted with the plans.

The plans have been carefully examined with respect to the sewerage system and sewage disposal works. In connection with the sewerage system the design has been carefully studied with reference to alignment, sizes, grades, capacities, durability, facilities for extension, repair, cleaning, and inspection and flushing, and other features of a hydraulic or sanitary nature. In connection with means for sewage disposal, it has been studied with reference to the present and future general method and efficiency of the sewage disposal plant as a whole, and of the capacities and practical operation of the individual structures, appurtenances, and apparatus.

The sizes of the sewers of the proposed sewer system are to vary from 8-inch to 12-inch in diameter, and are to be laid in general on slopes which appear to provide ample capacity and self-cleansing velocities under ordinary conditions. Manholes are provided at all sewer terminals, changes in direction, at sewer intersections, and at distances on straight alignment not farther apart than 500 feet on the 12-inch pipe and 400 on the smaller sizes. As surface water will naturally gravitate into the sewer trenches and often be under some ground water head, it is very essential that every precaution be taken to insure the tightness of the joints, and rigid inspection of this feature should be insisted upon before any back filling is allowed to be placed around the sewer pipes.

Only 270 house branches appear to be provided for the sewers to be constructed at first. The property frontage appears to be nearly 27,000 feet along the sewers planned for immediate installation. Unless ample branches are inserted in the sewer at the time of construction, property holders may later be seriously handicapped in making connections and the sewer itself imperiled, particularly where the property becomes closely built up and subdivided. It is, therefore, suggested that the number of house branches be materially increased.

Sewers are shown on every street, with a combined total length of about 30,475 feet. Of this length it is planned, however, to build at this time only about 14,275 feet, leaving about 16,200 feet, including 3,100 feet of outfall line, for future construction. The sizes, lengths, and location of the sewers for present and future construction are shown in the accompanying table.

The only slopes which do not seem to provide as high velocities as desirable are those on sewers planned for future construction on Washington street and Brown road, where the streets are either nearly level or graded in the opposite direction from the flow of the sewer, and are underlain with rock. It is felt that the opening up of other streets may permit more favorable grades to be secured, and that approval of plans which are represented as urgently needed, need not be withheld on this account, provided that these sewers, if built, be frequently examined and cleaned, and that flush tanks be provided at the upper ends of these sewers to facilitate cleaning and prevent stoppages.

Sewer Dimensions and Locations

LOCATION	12-inch C. I.	12-inch T. C.	10-inch T. C.	8-inch T. C.	6-inch C. I. double	Grand total	Sewers to be omitted temporarily from construction	Sewers for present construction
Disposal outfall	1,500	1,600	......	......	......	3,100	3,100	....
Storehouse alley	......	425	......	......	......	425	....	425
Basin street	......	1,025	725	925	......	2,675	600	2,075
Main street	......	......	1,425	1,925	......	3,350	1,475	1,875
Washington	......	......	750	2,725	......	3,475	2,200	1,275
Williams street	......	......	......	1,225	......	1,225	1,225	....
Franklin street	......	......	......	2,025	......	2,025	....	2,025
Rice crossing	......	......	......	775	......	775	775	....
Gould street	......	......	......	300	......	300	300	....
East St. Lawrence street	......	......	......	1,525	......	1,525	....	1,525
Mill street	......	......	......	300	......	300	300	....
Sand street	......	......	......	2,225	100	2,325	....	2,325
Brown road	......	......	......	3,175	......	3,175	3,175	....
Potter street	......	......	......	700	......	700	....	700
First street	......	......	......	525	......	525	525	....
Second street	......	......	......	525	......	525	525	....
West St. Lawrence street	......	......	......	1,650	......	1,650	1,225	425
Rice street	......	......	......	500	......	500	500	....
Third street	......	......	......	275	......	275	275	....
Pike street	......	......	......	1,125	......	1,125	....	1,125
Warren street	......	......	......	500	......	500	....	500
Totals	1,500	3,050	2,900	22,925	100	30,475	16,200	14,275

NOTE.— Except the outfall, all temporarily omitted sewers are 8 inches in diameter.

An inverted siphon of apparently appropriate design, composed of two parallel lines of 6-inch castiron pipe, is provided under the rocky bed of Phileman creek which is about 100 feet wide at the point crossed. The plan shows the minimum cover of concrete over these pipes to be 12 inches. It would seem that this minimum cover would occur where a cover of a foot or two of water might also be expected. It is, however, recommended that no less total cover be given this pipe, in which the sewage may frequently stand without flow, than would be given water pipes under similar conditions. The engineer's report states that arrangements have been made with the New York Central Railroad Company for the sewer to cross under its tracks by means of castiron pipe. Drop manholes and the proposed submerged direct outfall discharging into the river are shown in detail and appear to be of satisfactory design.

Above the point of discharge the Black river watershed has an area of about 1,900 square miles. Recorded flood discharge rates have been as high as 30,000 to 40,000 second feet. The minimum weekly discharge rate has fallen as low as about 500 second feet. The stream, however, seems to be a marked example of the benefit of storage and regulation, for in recent years the minimum flow for two days together appears seldom to average less than 1,000 second feet, and that only on Sundays during storage replenishment, while the maximum flood runoff appears to be reduced to between 15,000 and 25,000 second feet.

The disposal plant planned for future construction is shown located on a flat bluff situated on the north side of the river about 600 feet below the westerly village line and about 2,300 feet below the point of temporary discharge. The treatment plant shown by the detailed plans is to consist of a two-story settling tank. The proposed location of supplementary treatment works, consisting of contact beds followed by secondary settling tanks, is also shown on the general plans. The general elevation of the ground at the disposal plant site is about 30 feet above the level of the river, and the maximum fluctuation of the river at this point is about 7 feet, so that there is no danger that the operation of the plant will be interfered with by reason of high water.

The proposed treatment tank is planned to be constructed of concrete, and is to be 20 feet deep by 12 feet wide and 26 feet long. It is provided with plank covers and piped so as to permit of a reversal of the sewage flow and consequent better distribution of the deposit of sludge. The upper or sedimentation compartment or trough is supported by concrete beams at the third points, and is provided at the bottom with sides sloped 1¼ on 1 down to two 6-inch slots. This trough is 26 feet long by 10 feet wide and about 9 feet deep, giving a content of about 17,000 gallons, or 3 hours storage for sewage from a population of upward of 1,300 persons assuming a rate of sewage contribution of 100 gallons per capita per day. The sludge compartment below is shown provided with two hoppers, and has a content, measured 12 inches below the slots in the troughs above, of about 1,500 cubic feet, and is provided with side and center gas vents. Sludge removal is provided for by an 8-inch sludge pipe connected with each sludge-hopper. The outlet of each of these pipes is shown about 11 feet below the flow line of the tank. This is an objectionable feature, inasmuch as it would mean that the sludge bed would have to be constructed at a considerable depth below the surface of the ground in order to permit of draining the sludge pipes by gravity after each discharge of sludge. If the pipes are not drained after each discharge, the sludge running in the pipes would, in all probability, become consolidated and result in the clogging of the pipes. A head on the sludge pipe outlet of from 3½ to 4 feet would be sufficient and would permit of locating the sludge bed at a higher elevation than would be possible if the tank was constructed as planned. A perforated water pipe for forcing water under pressure into the sludge-hoppers to facilitate the removal or drawing off of the sludge should also be provided when the tank is installed.

As noted above, an application has been submitted by the board of trustees of the village under and in accordance with section 260 of the Village Law, asking for permission to omit temporarily the construction of the proposed sewage disposal plant and certain portions of the proposed sewer system. The portions of the sewer system to be constructed at first appear to cover the more developed sections of the village where the sewers are most urgently needed at present, and I do not see any objections to permitting the village to omit temporarily the construction of the remainder of the system which can be installed when required. With respect to the temporary omission of the construction of the disposal plant, I am of the opinion that the application of the village could appropriately be granted, considering the large dilution afforded by the regulated flow of the Black river at this point, the nature of the territory through which it flows, and the fact that no public water supply is derived from the river below Brownville at this time.

After a careful examination of the plans and a full consideration of the essential features of design and of the local and general requirements for sewerage and sewage disposal, I beg to recommend that these plans be approved, and a permit be issued to the board of trustees of the Village of Brownville to discharge sewage from the proposed system and disposal plant into the waters of the Black river under the following conditions:

1. That flush tanks shall be provided at the upper ends of all sewers having slopes of less than 4 per cent.

2. That the cover provided for the inverted syphon under the creek shall be sufficient to prevent its freezing and nowhere shall such cover be less than 3 feet.

3. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewer.

4. That whenever required by the State Commissioner of Health, the proposed settling tank shall be installed and put in operation.

5. That whenever the settling tank is constructed the sludge pipes shall be so installed as to permit of draining or flushing these pipes, and perforated water pipes shall be installed in the sludge-hoppers to facilitate the removal of the sludge.

6. That whenever required satisfactory detailed plans for sludge drying bed or beds shall be submitted to and receive the approval of this De-

partment, and that such sludge drying bed or beds shall be installed simultaneously with the settling tank.

7. That whenever required by the State Commissioner of Health, satisfactory detailed plans for additional works for more complete treatment of the sewage of the village shall be submitted for approval; and upon the approval of said plans any or all portions of such additional or supplementary works for more complete treatment of sewage shali be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

I would further recommend that permission be granted to the board of trustees to omit temporarily the construction of the sewage disposal plant and outlying portions of the sewer system.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *December* 13, 1920

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by article V of the Public Health Law, permission is hereby given to the Board of Trustees of the village of Brownville to discharge sewage temporarily from the proposed system of sewers in said village into the waters of the Black river within the municipality of Brownville, Jefferson county, N. Y., in accordance with the plans accompanying the application, under the following conditions:

1. That flush tanks shall be provided at the upper ends of all sewers having slopes of less than 4 per cent.
2. That the cover provided for the inverted siphon under the creek shall be sufficient to prevent its freezing, and nowhere shall such cover be less than 3 feet.
3. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewer.
4. That whenever required by the State Commissioner of Health the proposed settling tank shall be installed and put in operation.
5. That whenever the settling tank is constructed the sludge pipes shall be so installed as to permit of draining or flushing these pipes, and perforated water pipes shall be installed in the sludge-hoppers to facilitate the removal of the sludge.
6. That whenever required satisfactory detailed plans for sludge drying bed or beds shall be submitted to and receive the approval of this Department and that such sludge drying bed or beds shall be installed simultaneously with the settling tank.
7. That whenever required by the State Commissioner of Health satisfactory detailed plans for additional works for more complete treatment of the sewage of the village shall be submitted for approval; and upon the approval of said plans any or all portions of such additional or supplementary works for more complete treatment of sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.
Deputy State Commissioner of Health

Decemebr 14, 1920

CANAAN (Town) (Public School No. 1)

A sketch plan of the sewage disposal plant of Public School No. 1, in the town of Canaan, Columbia county, was approved on April 22, 1920. The disposal plant consists of a settling tank and a subsurface irrigation field apparently constructed in an artificial bed of gravel. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Trustees of School District No. 1, town of Canaan, to discharge effluent from the sewage disposal plant to serve the school in that district into the ground waters of the State tributary to Stony Kill, within the town of Canaan, Columbia county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the sewage disposal works.
4. That no sewage sludge from any part of the disposal works shall be discharged into the tributaries of Stony Kill, or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.
5. That when necessary the sludge shall be removed from the tank in such a manner as to cause no nuisance and disposed of by burying in some remote place.
6. That should it become apparent at any future time that the capacity of the filter bed or subsurface irrigation system is insufficient to care for the sewage from the school, satisfactory plans for extensions to the system shall be submitted to this Department for approval; and upon the approval of such plans the extensions shall be constructed and put in operation without delay.

M. NICOLL, JR.
April 22, 1920 *Deputy State Commissioner of Health*

CLAVERACK (Town) (States Metals Company)

Revised plans for the disposal of sewage and trade wastes of the factory of the States Metals Company, in the town of Claverack, Columbia county, were approved on September 2, 1920. The permits issued in connection with the approval of the plans follow:

PERMITS

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the States Metals Company to discharge sewage effluent from the proposed sewage disposal plant of said company at Claverack, N. Y., into the waters of Claverack creek opposite their property, within the town of Claverack, Columbia county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That the plant for the disposal of sanitary sewage shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.
2. That when necessary the sludge from the proposed tanks shall be removed and disposed of in such a manner as to cause no nuisance.

3. That no sewage sludge from any part of the disposal plant shall be discharged into Claverack creek or any other watercourse or deposited on the ground where it may be washed by rain or melting snow into any watercourse.

M. NICOLL, JR.
September 2, 1920 *Acting State Commissioner of Health*

Application having been duly made to the State Commissioner of Health, as provided by section 78 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to States Metals Company to discharge effluent from the proposed treatment plant for the disposal of trade wastes from the factory of said company into the waters of Claverack creek opposite their property within the town of Claverack, Columbia county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That the plant for the disposal of trade wastes shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.
2. That the wastes shall at all times be passed through all portions of the plant provided for this purpose by these plans.
3. That when necessary the sludge from the proposed tanks and beds shall be removed and disposed of in such a manner as to cause no nuisance.
4. That no sludge from any part of the disposal plant shall be discharged into Claverack creek or any other watercourse or be deposited on the ground where it may be washed by rain or melting snow into any watercourse.

M. NICOLL, JR.
September 2, 1920 *Acting State Commissioner of Health*

CLYDE

Plans for sewerage and sewage disposal for this village were approved on April 14, 1920. The report upon the examination of the plans and the permit issued in connection with their approval follow:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on the examination of plans for a proposed sewerage system and proposed sewage disposal plants for the village of Clyde, Wayne county, N. Y., submitted to this Department for approval by the engineer on behalf of the board of trustees of the village on March 24, 1920.

The village of Clyde, the population of which is estimated at about 2,700 people, is located on the Clyde river, in the southeastern part of Wayne county, 38 miles west of Syracuse. It is divided by the river into two parts, the larger section lying on the north side of the stream. The topography of the ground in the village, and particularly that in the built up sections, is flat. There are, however, a few small hills within the boundaries of the municipality. The river Clyde now forms a part of the New York State Barge canal, and in making it a part of the canal the State has raised the normal water level several feet, thus decreasing the available fall from the streets in the lower section of the village to the river and making the design of a satisfactory sewerage system more difficult.

The watershed tributary to the river above Clyde (Sodus street bridge) is, according to the reports of the State Engineer and Surveyor, 828 square miles; and the average flow of the stream at the Sodus street bridge in Clyde about 530 cubic feet per second, varying to a minimum of 250 cubic feet

per second and a maximum of about 3,000 cubic feet per second. The minimum flow of the river is, therefore, equivalent to about 90 cubic feet per second per 1,000 population. No municipal water supply is taken from the river below the village of Clyde.

The plans as submitted provide for a comprehensive sewerage system for the village and for four separate sewage disposal plants for the preliminary treatment of the sewage before its discharge into the Clyde river. The plans also indicate how the sewage may at some later date be conducted to one plant and given more complete treatment by means of sprinkling filters and final sedimentation tanks.

The sewerage system as proposed will consist of about 11⅛ miles of vitrified pipe sewers varying from 6 to 18 inches in diameter. The sewers appear to be of sufficient size to care for the sewage that will reach them, although a large portion of them are smaller in size than is generally considered desirable if the sewers are to be easily maintained in proper condition; and many of the grades are, on account of the topography of the ground, necessarily very flat. Automatic flush tanks are to be provided at the upper end of all the lines for the periodic flushing of the sewers and the prevention of the accumulation of sediment which would otherwise be likely to collect on account of the flat slopes. Manholes will be provided at frequent intervals and at all changes of grade and alignment to afford access to the sewers for inspection and cleaning.

The topography of the ground in the village is such that the sewage can be most readily collected by dividing the village into five districts and draining each to a separate point. Four of these districts can be drained to the river by gravity; but the sewage from the fifth. a small section in the northwest part of the village, will have to be lifted by pumps into the sewers of one of the other districts. The northeast district, or the largest of the five, will contain about 28,000 feet of sewers which will drain to a point between the abandoned Erie canal and the New York Central Railroad tracks about 900 feet east of Glascow street. Just north of this main district is a small district containing about 2,000 feet of sewers, the sewage from which will be drained to a point on Fulton street near Lock street, where a pumping station is to be constructed to lift the sewage into the sewers of the main district. It is probable that the sewers and the pumping station to serve this district will not be built for some time. The northwest district contains about 11,250 feet of sewers which will drain to a point on the north side of the river near the foot of Sibley street. The southwest district, lying opposite to the northwest district on the south side of the river, containing about 11,200 feet of sewers, will drain to a point on the south side of the river near the end of Water street. The last district, occupying the southeast part of the village and containing about 6,500 feet of sewers, will drain to a point on the bank of the river near Meadow street. The sewage from all these districts will for the present be given preliminary treatment in plants located as follows: One at the site of the main disposal works, on the north side of the river east of the Glascow street viaduct; the second near the foot of Sibley street; the third near the west end of Water street; and the fourth between Meadow street and the south bank of the river.

The disposal plant for treating the sewage from the main or northeast district is to be located between the abandoned Erie canal and the tracks of the New York Central Railroad, about 900 feet east of the Glascow street viaduct, and will for the present consist of a plain sedimentation tank and a sludge bed. The sedimentation tank will be of concrete and covered by a one-story frame building. It will be 12 feet by 99 feet in plan and 6 feet 6 inches deep below the flow line, making its capacity about 57,500 gallons. The population of the district which will drain to this tank, estimated by the number of houses shown on the engineer's plans, is at present about 1,650 people. Assuming that all these houses will be connected to the sewers and that the flow will be about 100 gallons per capita per day, the period of detention in the tank will be approximately 8⅓ hours. According to the

plans, the sewage will be discharged into a concrete trough extending across the full width of the inlet end of the tank. From this trough it will pass through a gate located at its center into the tank. It will then flow longitudinally across the tank and pass over a transverse weir extending the full width of the tank at the outlet end into an outlet channel which will discharge into a pipe leading to the river. Apparently no baffle is to be provided to prevent the escape of floating solids. The installation of such a baffle, set about 18 inches from the outlet weir and extending from about a foot above to about 2 feet below the flow line of the tank, would seem a desirable addition if the escape of the floating solids and consequent unsightly and unsatisfactory condition in the river are to be prevented. The bottom of the tank will slope toward an outlet provided in the lift valve located near one side of it at about one-third of its length from the inlet end. From this outlet a pipe will lead to a sludge well located adjacent to the tank. A 3-inch submerged vertical centrifugal pump will be installed in this well for lifting the sludge to the sludge bed.

The fact that the bottom of the tank is to have very little slope will make it necessary to empty the entire tank in order to remove the sludge. A pipe is to be provided by which the sewage can be discharged directly into the river without treatment when so desired and may be used for this purpose while the tank is being cleaned. This by-passing of the raw sewage directly into the river cannot be considered as entirely satisfactory, and the design could apparently be greatly improved and the operation of the plant made more easy by arranging the tanks so that the sludge could be drawn off from time to time without draining the tank.

The sludge bed is to be built up of 3 inches of coarse sand on 12 inches of broken stone. The walls and bottom of the bed are to be of concrete. The sludge will be applied to the bed from a concrete weir extending along one side and the effluent collected by troughs formed in the concrete bottom of the bed and protected by perforated concrete slabs. These drains or troughs will discharge into a main drain which in its turn will discharge into a pipe leading to the river. The bed, according to the engineer's report, will be 15 feet by 80 feet in plan and have an area of 1,200 square feet, the equivalent of about 0.73 square foot per capita, an area smaller than is usually considered advisable for use in connection with plain sedimentation tanks, and which will require that the plant be more carefully operated if satisfactory conditions are to be maintained.

This plant will be so arranged that its capacity may be increased when desired by the construction of additional units, and also so that sprinkling filters and secondary sedimentation tanks may be added to the plant should the more complete treatment of the sewage be required at some future date. In case such treatment is required, the sewage from the other districts will be pumped into the sewers of this district, and all the sewage of the village treated at the main disposal plant.

The Sibley street disposal plant will consist of a sedimentation tank and sludge bed similar to those proposed for the present construction at the main sewage disposal plant. The sedimentation tank will be 70 feet by 12 feet in plan and 6 feet deep below the flow line, making its capacity approximately 37,500 gallons, the equivalent of about 26 hours average flow based on a flow of 100 gallons per capita per day for the estimated population of the district. The engineer in his report, however, states that the population of this district may at some future time increase to 2,240, in which case the detention period would be reduced to 4 hours. This estimate of population seems to be a little high, and as the rate of increase in the population during the past 20 years has been very small, it is improbable that any material increase in flow will occur for many years. The sewage will enter the tank through two pipes set at about the one-third points of inlet end and at the level of the flow line, and leave over a steel outlet weir extending the full length of the tank at the outlet end. As in the case of the tank at the main disposal plant, apparently no baffle is to be provided to prevent the escape of floating solids. A sludge outlet is shown on the plans on the center line of the tank about one-third of its length from the inlet end. The pipe from this outlet

will connect to a sludge well adjacent to the tank containing a submerged vertical centrifugal pump by means of which the sludge may be lifted to the sludge bed. The plans do not indicate how the normal sewage flow will be cared for while the tank is being cleaned, but it is assumed that a by-pass similar to that to be used at the main plant will be provided for this purpose. The sludge bed which is to be constructed on the same general plan as that of the one to be installed at the main disposal plant, will be 12 feet by 70 feet in plan, making its area 840 square feet, the equivalent of about 2½ square feet per capita based on the estimated present population of the district. The plant will be so arranged that should it be necessary at some future time to provide for more complete treatment of the sewage, that the tank may be easily converted into a pump well and pumps installed for lifting the sewage into the sewers of the main district.

The Water street plant will be of the same general design as the Sibley street plant except that the size of the units will be slightly different. The tank will be 45 feet by 8 feet in plan and 6 feet deep below the flow line, making its capacity approximately 16,700 gallons, or the equivalent of 10½ hours average flow based on the estimated future population. The sludge bed is to be 11 feet by 45 feet in size, making its area 495 square feet, or the equivalent of about 1.3 square feet per capita. As in the case of the Sibley street plant, the tank is so arranged that it can be converted into a pump well and pumps installed for lifting the sewage into the sewers of the southeast or Meadow street district, from which it will be lifted again, together with the sewage from that district, into the sewers of the main district.

The Meadow street plant is to be of the same type as the 2 plants just mentioned. The tank will be 25 feet by 7 feet in plan and 6 feet below the flow line, making its capacity 7,850 gallons, equivalent to about 6½ hours average flow. The sludge bed will be 10 feet by 25 feet in size and its area 250 square feet, or the equivalent of about 0.92 square feet per capita. As in the case of the Sibley and Water street plants, the tank will be so arranged that pumps may be easily installed when desired and the sewage lifted into the sewers of the main sewer district.

In view of the above, and after a careful consideration of the essential features of the design and of local and general conditions, I would recommend that the plans be approved, and a permit issued to the Board of Trustees of the village allowing the discharge of the effluent from the four proposed sewage disposal plants into the Clyde river near the plants in the municipality of Clyde. I would further recommend that in addition to the usual revocation, modification, complete construction, and storm water clauses, the permit contain the following conditions:

1. That no sludge from any part of the sewerage system or sewage treatment plants be discharged or allowed to flow into the Clyde river or any other watercourse, or deposited on the surface of the ground where it may be washed by rain or melting snow into any watercourse.

2. That the sedimentation tank be provided with suitable baffles to prevent the escape of floating solids.

3. That before any sewers are laid or the pumping station constructed in the Fulton street district, complete detailed plans for a proposed pumping station for that district shall be submitted to this Department for approval and the approval of the Department received.

4. That whenever required by the State Commissioner of Health, satisfactory detailed plans for the more complete treatment of the sewage of the village shall be submitted to this Department for approval and the approval of the Department received; and after the approval of said plans, any or all portions of the disposal plant for the more complete treatment of the sewage shall be constructed and put in operation whenever required by the State Commissioner of Health.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *April* 12, 1920 *Chief Engineer*

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 77 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to Board of Trustees of the village of Clyde to discharge the effluents from the 4 proposed sewage disposal plants into the waters of the Clyde river near the plants within the municipality of Clyde, Wayne county, in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs or other areas, shall be admitted to the proposed sewers and sewage disposal works.
4. That no sewage sludge from any part of the disposal works shall be discharged into the Clyde river, or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into the Clyde river or any other watercourse.
5. That the sedimentation tanks be provided with suitable baffles to prevent the escape of floating solids.
6. That before any sewers are laid or the pumping station constructed in the Fulton Street district, complete detailed plans for a proposed pumping station for that district shall be submitted to this Department for approval and the approval of the Department received.
7. That whenever required by the State Commissioner of Health satisfactory detailed plans for the more complete treatment of the sewage of the village shall be submitted to this Department for approval; and after the approval of said plans any or all portions of the disposal plants for the more complete treatment of the sewage shall be constructed and put in operation whenever required by the State Commissioner of Health.

M. NICOLL, JR.
April 14, 1920 *Deputy State Commissioner of Health*

COBLESKILL

Plans for a proposed sewer extension in South Washington avenue between West Main street and the proposed Riverside Drive were approved on September 2, 1920. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 77 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Sewer Commissioners of Cobleskill to discharge sewage from the sewer extension in South Washington avenue into the waters of Cobleskill creek through a temporary outfall within the municipality of Cobleskill, Schoharie county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewer extension.

2. That the sewer extension shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.

3. That whenever required by the State Commissioner of Health, the sewage to be collected by the proposed sewer shall be intercepted by an intercepting sewer and conveyed to a suitable site for the disposal of the entire sewage of the village in accordance with plans which shall first be submitted to and receive the approval of this Department.

4. That whenever required by the State Commissioner of Health, satisfactory detailed plans for preliminary treatment of the entire sanitary sewage of the village of Cobleskill, accompanied by general plans for supplementary works for more complete treatment of the sewage, shall be submitted to this Department for approval; and that after the approval of said plans such works for the preliminary treatment of the sewage of the village shall be constructed and put in operation at such time or times as the State Commissioner may require.

M. NICOLL, JR.
September 2, 1920 *Acting State Commissioner of Health*

COBLESKILL (State School of Agriculture)

Plans for a proposed sewer extension to serve the Home Economics building at the Schoharie State School of Agriculture were approved on March 26, 1920.

COLUMBUS (Town) (Phoenix Cheese Company)

Plans for the disposal of sewage and wastes from the factory of the Phenix Cheese Company, near South Edmeston, in the town of Columbus, were approved on November 11, 1920. The plans provided for some 855 feet of 15-inch tile pipe and 75 feet of castiron pipe extending from the factory to a point about midstream in the Unadilla river. The sewer is to receive the waste water and washings from the plant, the condensing and cooling water, and the sewage from the toilets. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by article V of the Public Health Law, permission is hereby given to the Phenix Cheese Company to discharge waste water and washings, cooling and condensing water, and sewage from the plant of said company, near South Edmeston, into the waters of Unadilla river within the town of Columbus, Chenango county, N. Y., in accordance with the plans accompanying the application, under the following conditions:

1. That no whey, buttermilk, or other wastes containing considerable quantities of putrescible organic matter shall be discharged into the stream.

2. That whenever required by the State Commissioner of Health, a complete separation shall be made of the unpolluted cooling and condensing water, and the waste water and washings, and the sewage from the toilets in the factory, and

3. That whenever required by the State Commissioner of Health, satisfactory detailed plans for disposal works for the treatment of the waste water and washings, and the sewage from the toilets, shall be submitted to this Department for approval; and after the approval of said plans any or all portions of such disposal works for the treatment of the waste water and washings and sewage shall be constructed and put in operation at such time as said Commissioner may designate.

4. That the intake in the Unadilla river of the auxiliary water supply for the factory of the Phenix Cheese Company be extended upstream a reasonable distance above the point of discharge of the wastes.

M. NICOLL, JR.
November 11, 1920 *Deputy State Commissioner of Health*

COMSTOCK (Great Meadow Prison)

Amended plans for a screening manhole for the sewerage system and disposal works at this institution were approved on July 27, 1920. Plans for a sewer extension to serve the Mitchell House were approved on October 6, 1920.

CORTLANDT (Town) (Baron de Hirsch Agricultural School)

Plans were approved on January 6, 1920, for sewerage and sewage disposal for the Baron de Hirsch Agricultural School, in the town of Cortlandt, Westchester county. The report upon the examination of the plans and the permit issued in connection with the approval of the plans follow:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on our examination of plans for sewerage and sewage disposal for the Baron de Hirsch Agricultural School, submitted to this Department for approval on November 25, 1919, by Mr. A. E. Hansen, consulting sanitary engineer, New York city.

The property of the Baron de Hirsch Agricultural School is located in the towns of Cortlandt and Yorktown, Westchester county, aobut 2 miles east of the village of Peekskill. This property on which the institution is located is partly on the Croton watershed of the New York city water supply and partly on the watershed of the Peekskill Hollow creek from which is derived the water supply of the village of Peekskill.

The records of this Department show that it was originally intended to locate the buildings and some of the sewers of the Baron de Hirsch Agricultural School on the watershed of a stream tributary to the Croton lake water supply of New York city. Rules and regulations for the protection of the water supply of New York city from contamination approved by this Department in 1917 require that all plans for sewage disposal plants to be constructed on the watershed from which the water supply of New York city is derived must receive the approval of the Department of Water Supply, Gas and Electricity of New York city. The proposed location of the buildings and sewage disposal plant upon the Croton watershed was opposed by the Department of Water Supply, Gas and Electricity of New York city.

It was then proposed to locate the buildings and sewage disposal plant upon the watershed from which the Peekskill water supply is derived. You took the position, therefore, that before consideration could be given to plans for sewerage and sewage disposal for this school that such plans should first receive the approval of the village authorities of Peekskill. In a letter from the Superintendent of the Board of Water Commissioners dated June 6, 1919, this Department was informed that the Board of Water Commissioners of the village of Peekskill had by resolution approved of the proposed location and system of sewage disposal to be used for the Baron de Hirsch Agricultural School, subject to the approval of this Department.

The plans now submitted for approval were prepared by Mr. Hansen, and comprise tracings and blueprints showing the proposed system of sewers and sewage disposal plant.

The report of the designing engineer submitted with the plans states that it is proposed to construct at present only part of the buildings which will ultimately be constructed for the school. The population expected at the school at present will probably not exceed 75 people, but the ultimate total

population at the institution is expected to be about 200 people. It is proposed, therefore, to construct only those sewers necessary to care for the sewage of the buildings to be constructed in the immediate future. In regard to the sewage disposal plant, which is to consist of a settling tank, dosing tank, sand filters, chlorinating plant, sludge bed and sludge bed effluent filter, it is proposed to construct only 2 of the 4 sand filter units. In every other respect the sewage disposal plant to be constructed is to be adequate for the ultimate population which will contribute sewage to it.

The plans submitted for approval include sewers for the future development of the institution. These are vitrified tile sewers and are to be 6 inches and 8 inches in diameter. The 6-inch sewers are to be laid with a maximum grade of 4.31 per cent and with a minimum grade of 1 per cent, while the 8-inch sewers are to be laid with a maximum grade of 13.63 per cent and a minimum grade of 1 per cent. These grades are apparently sufficient to provide self-cleansing velocities of the sewage in the sewers under ordinary conditions, and the sewers are apparently adequate in size to care for the sewage which will be contributed to them.

Drop manholes are to be located at every change of grade and alignment in the sewers. The maximum spacing between manholes is not greater than 175 feet and the minimum spacing is about 50 feet. It would therefore appear that ample provision has been made for inspecting and cleaning the sewers.

The sewage collected by the sewerage system is to be conveyed to the sewage disposal plant through an 8-inch vitrified tile pipe sewer. The sewage disposal plant is to be located near the western boundary of the property on the watershed from which the Peekskill water supply is derived. Upon reaching the disposal plant the sewage will be discharged into a plain settling tank of the horizontal flow type. This settling tank which is to be constructed of concrete and covered by a wooden building, is to be 20 feet by 26 feet in plan with a depth ranging from 5 to 7 feet. Longitudinal concrete walls are to divide the settling tank into 4 compartments, 2 feet 3 inches, 4 feet 6 inches, 6 feet 9 inches, and 9 feet wide respectively. It is intended by this division of the tank to facilitate the use of 1/10 of the capacity of the tank and multiples thereof in order that the period of detention of the sewage in the tank may be adjusted to the increasing volume of sewage flow as the population at the school increases.

The sewage is to discharge into a concrete distributing trough from which it will flow through a single inlet to be controlled by a valve into each compartment of the tank. No baffle has been provided in front of the inlets of the settling tank and the inlets are not submerged below the level of the sewage in the tank. The sewage is to flow out of the tank through a weir into a concrete collecting channel which will convey it to a manhole from which an 8-inch vitrified tile sewer will carry it to the dosing tank.

The several compartments of the settling tank will have capacities of about 2,925 gallons, 4,050 gallons, 6,075 gallons, and 8,100 gallons respectively. Assuming a water consumption of 100 gallons per capita per day at the school, a total water consumption for the present of 7,500 gallons per day and a future water consumption of 20,000 gallons per day is obtained. On this basis, the smallest compartment of the settling tank will have an average period of detention of the sewage in the compartment of slightly more than 6 hours for the present volume of sewage flow. The total capacity of the tank is sufficient to provide a period of detention of the sewage in the tank of about 24 hours for the ultimate volume of sewage flow expected.

The bottom of the settling tank is to be sloped toward a sump at the inlet end of the tank. In this sump, sludge outlets controlled by valves are to be located in each compartment of the tank. These outlets discharge into a 10-inch castiron sludge pipe which will convey the sludge to the sludge bed. At the outlet end of each compartment at a point about 12 inches above the sloping bottom of the tank is to be located an outlet controlled by a valve. These outlets are to be used to draw off the supernatant sewage above the sludge through a 4-inch castiron pipe and discharge it into the outlet pipe to the dosing tank before removing the sludge. It would appear that if

these outlets were raised some 6 inches higher above the bottom of the tank, provision would be made for a greater sludge storage capacity in the tanks.

The sludge bed is to be constructed with concrete walls and a concrete floor and is to be provided with a removable glass roof. A ventilating stack extending some 21 feet above the roof of the sludge bed is also to be provided. The filtering material of the sludge bed is to consist of 6 inches of filter bed sand having an effective size of from 0.25 millimeters to 0.35 millimeters, and a uniformity coefficient not greater than 4; 6 inches of torpedo gravel; 6 inches of ½-inch gravel; and 6 inches of ¾-inch to 1 inch gravel. The concrete floor of the sludge bed is to be sloped toward channels at each side. From the plans it would appear that these channels are to be filled with coarse gravel. The sludge bed is to be 10 feet by 17.5 feet in plan, which provides a total area of 175 square feet. The area provided should be adequate to care for the sludge from the population which will contribute sewage to the sewage disposal plant.

The underdrains of the sludge bed are to discharge on to concrete slabs in the corners of a sand filter to be constructed as a contiguous part of the sludge bed. This sand filter is to be constructed of concrete, 10 feet by 10 feet in plan, and is to contain 2 feet 3 inches of filter sand of the same specifications as those mentioned above, and 3 inches of torpedo gravel laid over an underdrain surrounded by ½-inch gravel. The bottom of the sludge bed filter is to be sloped toward the underdrain which will be located at the center of the bed, and will consist of 4-inch unglazed hexagonal tile to be laid with 1/8-inch open joints covered with strips of tar paper 2 inches wide. The effluent of the sludge bed effluent filter is to discharge through a manhole on the discharge line from the dosing tank to the sand filter. As the effluent from the sludge bed is to be discharged on to the sand filters, it would appear unnecessary to filter the effluent before it is discharged on to them.

The sludge after drying on the sludge bed is to be buried in trenches which are to be located at such a point that no direct surface water wash can carry the sludge into a watercourse.

From the manhole at the settling tank the sewage is to flow through an 8-inch sewer to the dosing tank, which is to be constructed of concrete with a concrete roof containing a manhole and cover. The dosing tank is to be 16 feet by 16 feet in plan and is to have a maximum depth of 2 feet 11 inches below the level of the sewage at which the siphon will discharge. A capacity of about 5,000 gallons has therefore been provided in the dosing chamber, which will cause the siphon to discharge at the rate of about once a day for the present flow of 7,500 gallons per day, and about 4 times per day for the future volume of sewage flow of 20,000 gallons per day.

The dosing tank is to contain a single 8-inch Miller siphon having a rate discharging capacity of 2.12 cubic feet per second. The dosing tank will therefore be discharged in about 5 minutes. One complete discharge of the dosing tank will theoretically cover 1 sand filter unit to a depth slightly greater than 2 inches.

From the dosing tank the sewage will be discharged through a 12-inch castiron main distributing sewer through a diverting chamber onto either of 2 sand filter units. The sand filters to care for the ultimate volume of sewage flow are to consist of 4 units, and provisions have been made to distribute the sewage on these beds when they are built. The future sand filters are shown on the plans at present submitted for approval and are to be similar in area and construction to those to be built at present. The distribution of the sewage on to either of the sand filter units is to be manually controlled. It would appear that more positive results would be obtained and more uniform alternation of the discharge of the effluent from the settling tank on to the sand filter units effected if plural alternating siphons and the necessary additional distribution piping were installed to distribute the effluent on to the filter.

The sewage is to be discharged onto the sand filter units by means of distributing troughs having concrete bottoms and wooden sides. These troughs are to be provided with adjustable gates spaced at intervals of 12 feet. The sand filter units are to be constructed by excavation and embankment

and are to consist of 3 feet of filter sand to have an effective size of from 0.25 to 0.35 millimeters, and a uniformity coefficient less than 4; 3 inches of torpedo gravel; 3 inches of ½ inch to ¾ inch gravel; and from 0 to 6 inches of 1 inch to 1½ inch gravel to be laid over the underdrains. The floor of each filter is to be sloped toward the underdrains which are to consist of 6-inch drain tile placed 12 feet 1½ inches apart on centers with a grade of about 1.16 per cent. These underdrains will discharge into 8-inch main collectors which will convey the sewage to a 12-inch sewer to the chlorinating building.

Each of the 2 filter units is to be 55 feet by 55 feet in area. A total area of about .138 acre has therefore been provided for the present volume of sewage flow, and of about .276 acre for the ultimate volume of sewage flow. These areas are sufficient to provide a rate of application of the sewage to the sand filters of about 54,000 gallons per acre per day at present and of about 72,000 gallons per acre per day in the future.

The sand filter effluent is to be conducted to the chlorinating building, which is to consist of a concrete detention chamber covered by a small building in which will be housed duplicate solution feed chlorinators. In this building will also be located a scales and a stove. The detention chamber is to be divided into 2 chambers by a transverse concrete wall. The combined capacity of these 2 chambers will be about 1,500 gallons, which for the volume of sewage flow expected at present will provide an average period of detention of the sewage in the chamber of slightly more than 4 hours and an average period of detention of slightly more than 1 hour for the ultimate volume of sewage flow.

The sewage is to enter the first compartment of the detention chamber through an elbow extending downward, and the chlorine is to be applied to the sewage as it flows downward through this elbow into the detention chamber. The rate of application of the chlorine to the sewage is not stated in the report submitted by the designing engineer with the plans. As the effluent from this disposal plant is to be discharged into a watercourse from which is derived a public water supply, it is important that the effluent be effectively chlorinated at all times, and a uniform rate of application of the chlorine to the sewage treated of not less than 5 parts of chlorine per million parts of sewage should be used.

From the chlorinating building the effluent is to flow through an 8-inch castiron outfall sewer a distance of about 150 feet to a small watercourse. It appears from the plans that this watercourse is to be obstructed above the point of discharge of the effluent from the filter plant into it by the construction of the sand filters, and that there will be very little runoff tributary to this stream. The report of the designing engineer states that this stream bed is tributary to Gregory Pond at a distance of about 1,000 feet below the point of discharge of the disposal plant effluent into it. This report states further that the stream bed loses its pronounced character on the slope leading to the pond, and it is expected that the effluent will be distributed over the ground surface and be absorbed by the ground during the greater part of the year.

In view of the results of our examination of these plans, and after a careful consideration of the essential features of the design and of local and general requirements with respect to the proper methods for the disposal of sewage from the proposed sewerage system and sewage disposal plant of the Baron de Hirsch Agricultural School, I beg to recommend that these plans be approved. I further recommend that a permit be granted for the discharge of sewage effluent from the proposed sewage disposal works into a tributary of the Peekskill Hollow creek, in the town of Cortlandt, Westchester county, on the following conditions:

1. That a uniform rate of application of the chlorine to the effluent of the sand filters of not less than 5 parts of chlorine per million parts of sewage treated shall be maintained at all times.

2. That no sewage sludge from any part of the disposal plant shall be discharged into Peekskill Hollow creek, its tributaries, or any other watercourse, or be deposited upon the surface of the ground at such a

point that it may be washed by rain or melting snow into Peekskill Hollow creek or any other watercourse.

3. That whenever the sewage tributary to the proposed disposal plant shall exceed that contributed by 75 persons, sand filter units Nos. 1 and 4 shall be constructed and put in operation.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *December* 11, 1919 *Chief Engineer*

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to Baron de Hirsch Fund to discharge effluent from the proposed plant to serve the Baron de Hirsch Agricultural School near Peekskill, N. Y., into the waters of a tributary to Peekskill Hollow creek within the town of Cortlandt, Westchester county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.

2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.

3. That the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.

4. That a uniform rate of application of the chlorine to the effluent of the sand filters of not less than 5 parts of chlorine per million parts of sewage treated shall be maintained at all times.

5. That no sewage sludge from any part of the disposal plant shall be discharged into Peekskill Hollow creek, its tributaries, or any other watercourse, or be deposited upon the surface of the ground at such a point that it may be washed by rain or melting snow into Peekskill Hollow creek or any other watercourse.

4. That whenever the sewage tributary to the proposed disposal plant shall exceed that contributed by 75 persons, sand filter units Nos. 1 and 4 shall be constructed and put in operation.

7. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal plant.

M. NICOLL, JR.

January 6, 1920 *Deputy State Commissioner of Health*

EASTHAMPTON (Town) (Fisheries Products Company)

Plans for the disposal of wastes from the fish factory of the Fisheries Products Company, at Promised Land, in the town of Easthampton, were approved on May 22, 1920. The report on the examination of the plans and the permit issued in connection with the approval of the plans follow:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on the examination of plans for the disposal of the wastes from the Fisheries Products Company's fish factory at Promised Land, town of Easthampton, Suffolk county, N. Y., submitted to this Department for approval by the company on May 6, 1920.

The fish factory of the Fisheries Products Company is located on the south shore of Gardiner's bay, about 2 miles east of the unincorporated village of Amagansett. The land in the vicinity is in general waste land, either bare or covered with brush and scrub oaks and pines. The only dwellings in the vicinity are a few large summer residences, apparently recently constructed, located on high ground a little over a mile west of the factory. Another smaller fish factory known as the Triton plant is located immediately west of the Fisheries Products Company's plant.

The factories manufacture fish oil from manhaden fish and produce a scrap which is used as a base for the manufacture of fertilizer. The capacity of the Fisheries Products Company's factory is such that it can handle from 8,000 to 10,000 barrels of fish per day. About 600 men and a fleet of 17 boats are engaged during the season from June to October in obtaining fish for the plant, and from 250 to 325 men are employed at the factory.

The fishing boats are brought along side of a pier extending about 300 feet out into the bay, and the fish lifted from the boats by 1 of 2 chain and bucket elevators to hoppers discharging on to a conveyor running longitudinally along the center of the pier above the fish pen, a bin about 200 feet long and 20 feet wide having a capacity of approximately 12,000 barrels of fish. Gates are provided in the conveyor trough to allow the discharge of the fish into any part of the pen. Below the bin a second longitudinal conveyor is arranged to take the fish to the cooker and press house located immediately back of the pier. Openings with removable covers are provided in the bottom of the bin by means of which the fish may be dropped on to this conveyor

At the cooker and press house the fish are fed into 2 cylindrical horizontal cookers arranged to cook the fish by steam. Helical conveyors carry the fish through the cookers and discharge them into a bin at the lower end of a bucket conveyor which lifts them into a hopper discharging on to a conveyor leading to a battery of 6 presses.

These presses are of the screw type. Each consists of a horizontal circular cage made up of iron bars set far enough apart to allow the passage of the oil between them and to retain most of the flesh of the fish. The cage being slightly smaller at the outlet end than at the inlet, the fish are compressed as the screw forces them through the press: the oil, together with a certain amount of slime, blood, and small particles of flesh, escaping between the openings of the slats, and the larger part of the flesh being discharged from the press at the outlet end. The oil and other liquids are collected by shallow tanks or hoppers below the presses and conducted by troughs to the oil recovery tanks. The flesh or scrap falls into a helical conveyor which is arranged to discharge on to a conveyor leading to the scrap pile, or on to one leading along the pier adjacent to the one just mentioned, by means of which the scrap may be discharged directly into boats. This latter conveyor was being reconstructed at the time of the inspection of the plant on May 17, 1920, and it was stated that it is the intention of the owners to transfer the scrap directly from the presses to the boats whenever possible. Facilities are provided for treating the scrap with sulphuric acid as it passes to the scrap pile or to the boats. It is understood that this treatment fixes the phosphates and renders the scrap more valuable as a fertilizer base. The treatment also acts to some extent to prevent the putrefaction of the scrap.

The oil recovery tanks which receive the oil and other liquids from the presses are arranged to operate in series. The first 2 tanks act to a certain extent as sedimentation tanks, and are arranged so that the fine scrap which escapes from the presses with the oil and other liquids can be discharged into a bin on the floor below and lifted by a bucket conveyor to the presses where it is repressed. The tanks are provided with steam pipes, baffles, and skimming devices for separating and skimming off the oil. The oil from these tanks after cooling is pumped to storage tanks located about a quarter of a mile east of the plant and stored there until shipped. The gurry from the oil recovery tanks is pumped to a filter house near the oil storage tanks and there mixed with sawdust and shavings and pressed to recover the oil in it. The cakes of sawdust and gurry after pressing have no value and are piled outside of the press house. It is said that these cakes give off no odors.

The other liquids from the oil recovery tanks are discharged into a concrete tank known as the fish water tank. This tank is 123 feet by 31 feet by 8 feet in size and has a capacity of about 200,000 gallons, the equivalent of about 5 times the estimated flow of fish water from the oil recovery tanks. From this tank the liquid is pumped to a battery of 4 steam heated vacuum evaporators. The vapor from these evaporators is said to contain no oil and is condensed in jet condensers and discharged into the bay. The semi-viscous mass known as gurry stick left in the evaporators is discharged into a covered concrete tank about 24 feet by 35 feet by 9 feet in size from which it is from time to time transferred to the scrap pile. No exact information is available as to the capacity of the evaporators. It is stated by the owners of the factory that the evaporators will care for the average daily flow of fish water from the tanks just mentioned and those on the wharf described below; but they are apparently not capable of evaporating the water at the maximum rate of flow, and on account of frequent breakdowns cannot always care for the average flow. There is room in the evaporator house for the installation of additional evaporators, but it is stated by the owners of the factory that it is impossible to secure the delivery, within a year, of the only type of evaporator suitable for the work.

Due to the handling of the fish, a considerable quantity of oil, slime, blood, etc., drains from the fish on the conveyors and in the bin. This liquid is collected by troughs below the conveyors and bin and conducted to oil recovery tanks on the wharf similar to those just described. The oil from these tanks is pumped to the oil storage tanks the same as that from the oil recovery tanks at the press house. The gurry and fish water from these tanks have been, however, discharged directly into the bay.

As pointed out in our report of September 16, 1919, the factory at present is faulty in construction and has in the past been improperly maintained and operated and an objectionable and serious nuisance was created during the summer of 1919, due to the breeding of flies, the emanation of objectionable odors, and the discharge of oil, gurry, and other wastes into the bay. It was recommended in this report of September 16, 1919, that all the conveyors, tanks, and vats be made water-tight, and that all liquid wastes now discharged into the bay be collected to one point where they may be disposed of either by evaporation or some other suitable means; that all scrap be shipped away as fast as possible; and that all parts of the premises where flies may breed be sprinkled with a suitable disinfectant at regular and frequent intervals.

The plans now submitted contemplate certain alterations and additions to the plant to improve its sanitary condition.

In order to prevent the direct discharge into the bay of the offal falling on the deck of the pier, a 3-inch reinforced concrete slab, covering an area of about 315 by 45 feet in size, will be constructed under the fish bin and conveyors on the wharf. This slab will be graded toward the center and 2½-inch drains spaced 50 feet apart will be provided to discharge the matter collecting on the slab floor together with the water used for cleaning it into troughs to be constructed under the pier. These troughs will lead to a timber sedimentation tank which will also receive the deck washings and bilge from the boats. There is nothing on the plans or in the engineer's report to indicate the size and slope of the troughs below the deck of the wharf nor how they will be kept free from obstructions. This would seem to be an important matter, since any stoppage of these troughs would allow the wastes to overflow the sides of the troughs and fall directly into the bay. In order to prevent such occurrences the troughs should be carefully graded, and suitable manholes arranged at frequent intervals should be provided in the deck over them to permit access for inspection and cleaning. The sedimentation tank is to be located under the deck of the wharf on the west side, and will be 16 feet by 12 feet in plan and 10 feet deep, making its capacity about 2,000 cubic feet, or 15,000 gallons. The tank is to be divided into three compartments by a transverse weir extending from the bottom to within about 2 feet of the flow line at a point 6 feet from the inlet end of the tank, and a baffle extending from the top to about 18 inches

of the bottom at a point 3 feet from the outlet end of the tank. Since there is no available data as to the quantity of wastes that will reach this tank, the detention period, the velocity of flow, and the probable quantity of solids that will collect in the tank cannot be accurately estimated. The wastes will enter the first compartment of the tank at the center of one end through an 8-inch castiron pipe which will extend to a point about 18 inches above the bottom, pass out of the first compartment over the weir into the second compartment, and then out of the second under the baffle into the third compartment, and finally out of the tank through a standpipe overflow near the center of the outlet end. Three trap doors, each about 24 inches square, are to be provided in the dock of the wharf over the tank to afford access for inspection and cleaning. It is understood that any oil collecting on the surface will be skimmed off and taken to oil recovery tanks, and that the sediment will be dipped out when necessary and carried to the scrap pile.

The fish water from the oil recovery tanks at the press house and on the wharf, and some bilge water from the boats, amounting in all, according to the report of the designing engineer, to about 80,000 gallons per day, will be conducted to the fish water tank which is to be remodeled. This tank when modified will consist of a concrete structure about 121 by 31 feet in plan and 7 feet deep covered with a corrugated metal roof. The tank will be divided into three compartments by a concrete partition wall extending longitudinally through the center of the tank from one end to within about 10 feet of the opposite end, and 2 transverse partitions, 1 extending from the center wall to the north wall about 45 feet from the west end of the tank and the other from the center wall to the south wall at the end of the center wall and about 10 feet from the east end of the tank. The transverse walls will be only 4½ feet high and will therefore act as weirs. The 3 compartments, which will operate in series, will therefore have capacities of about 60,000 gallons, 45,000 gallons, and 23,000 gallons, a total of 128,000 gallons when filled to the level of the tops of the transverse partition or weirs. If, however, the tank is filled to its high water line, it will contain approximately 150,000 gallons. With the estimated average flow of fish water the first compartment will hold about 18 hours average flow before the liquid overflows into the second compartment, and the entire tank about 48 hours flow before the liquid will overflow to the cinder screens described below. Each of the compartments of the tank is to be provided with a transverse wooden baffle extending from the top to a point 18 inches above the bottom. The baffle in the first compartment is to be located near the center of the compartment, that in the second about two-thirds of the distance from the inlet to the outlet end, and that in the third about 10 feet from the outlet end or three-quarters of the distance from the inlet to the outlet end of the compartment.

Under normal conditions the fish water from the oil recovery tanks will be discharged into the first compartment of the fish water tank, and pumped from there to the evaporators through a 3-inch pipe connected to the inlet end of the tank. Should, however, the evaporators break down, or for any reason be unable to handle the flow of fish water, the liquid will overflow into the second compartment and then into the third, and finally make its escape through the outlet to the cinder screens.

These cinder screens will consist of five beds of coarse, four beds of medium, and five beds of fine cinders, each 7 by 9 feet in plan and 5 feet deep, provided with concrete walls and floors, and be grouped in two rows forming a structure about 68 by 16 feet in plan. The beds are to be connected to operate in series. The wastes from the fish water tank will be discharged onto the first coarse bed, pass down through that bed and up through a rectangular outlet box extending from about 18 inches above the bottom of the bed to the top of the next bed, then in the same manner through each of the beds in turn. The outlet from the last of the beds will discharge into an 8-inch pipe leading to the bay. The level of the liquid on the filters will be about 6 inches above the top of the cinders. A total loss of head of only 0.4 of a foot is allowed for from the inlet to the outlet of the series Perforated steam pipes will be provided in the beds to assist in separating any oil

which may be carried to them with the fish water. According to the statements of the designing engineer, any oil which accumulates on the surface of the liquid on the cinder beds will be skimmed off and taken to the oil recovery tanks, and the cinders when they become clogged will be removed and taken to the scrap pile and new cinders placed in the bed.

It is intended that the cinder screens will be used only when the evaporators fail or are unable to handle the total flow. If, however, the entire estimated flow of 80,000 gallons per day should reach the filters, the rate of filtration in each bed will be about 55,000,000 gallons per acre per day, or 0.85 of a gallon per square foot per minute. There is no data available from which the probable loss of head through the filters and the time during which they will operate before clogging can be accurately estimated. The rate of filtration given above is several times as great as has ever been attempted with domestic sewage, and it seems probable that unless the cinders are very clean and coarse that there will be considerable loss of head and that clogging will take place in a very short time.

There will be very little domestic sewage discharged from the factory. Earth vault privies and privies projecting out from the edge of the wharf are provided for the men working at the plant. In the owners' cottage, however, there is a bathroom with three fixtures, and in the office building one toilet and one lavatory. In addition to these, there is of course the waste from the sinks in the kitchen of the mess hall. All of this sewage is at present discharged directly into the bay.

It is now proposed to construct a settling tank about 50 feet above the high water line of the bay to treat the wastes from the kitchen and office building, which are located not far apart, and to discharge the effluent from the tank into the bay through a 4-inch outlet extending 100 feet beyond the low water mark. The proposed settling tank, which is intended to act also as a grease trap will be a covered concrete structure 17 feet 6 inches by 6 feet in plan and 4 feet deep below the flow line, making its capacity about 3,000 gallons. The tank will be divided into 3 compartments by 2 transverse walls or weirs, 1 located 4 feet from the inlet and the other located 4 feet from the outlet end extending from the bottom of the tank to the flow line. The middle compartment is divided at its center by a transverse wooden baffle extending from the under side of the roof to a point 12 inches above the floor of the tank. The inlet and outlet of the tank consist of Ts, with one branch of each extending about 3 feet below the surface of the liquid. Two manholes will be provided to afford access to the tank for inspection and cleaning. The sewage from the owners' cottage is to be disposed of in a leaching cesspool about 6 feet in diameter and 6 feet deep located near the cottage.

In view of the above facts, and after careful consideration of the essential features of the design and of local and general conditions, I would recommend that the plans be approved, and a permit issued to the Fisheries Products Company allowing the discharge of the effluents from the proposed works to treat the trade wastes and domestic sewage from their factory into the waters of Gardiner's bay, and the ground waters of the State tributary to Gardiner's bay, at the points indicated on the plans on the property of the Fisheries Products Company, in the town of East Hampton, Suffolk county, N. Y., subject to the following conditions:

1. That all the proposed improvements for bettering the sanitary conditions at the fish factory, including pavements, drains, troughs, sewers, sewage and waste disposal works and their appurtenances shown by the plans approved this day, shall be fully constructed in complete conformity with such plans or approved amendments thereof except where variations are expressly required by the conditions of this permit, and the work completed before the fish factory is put in operation.

2. That no oil, gurry, stick, filter press wastes, or scrap shall be discharged or thrown or allowed to flow or fall into Gardiner's bay or any tributary thereof, or deposited on the ground where it may be washed into Gardiner's bay or any tributary thereof; and that no water or liquid which has drained from or come in contact with any fish, oil,

gurry, scrap, or which contains any oil, blood, slime, gurry, scrap, sewage from toilets, sinks, lavatories or showers, or other putrescible matter shall be discharged or allowed to flow into Gardiner's bay or any tributary thereof, or onto the ground where it may flow into Gardiner's bay or any tributary thereof, except through the outlets shown on the plans approved this day.

3. That the evaporators used for evaporating the fish water be maintained in proper working condition at all times, and that should it be found that the present evaporators have not sufficient capacity to dispose of all the fish water, except such small quantities as for short periods may be taken care of by the cinder screens, additional evaporators be installed with as little delay as possible.

4. That the cinder screens be used only in case of emergency and to treat such small quantities of water as the evaporators may for short periods at times of maximum flow be unable to dispose of, and that the cinders be removed and disposed of in such a manner as to create no nuisance and replaced with new cinders whenever the beds become clogged.

5. That should the cinder screens prove to have insufficient capacity properly to care for the tank effluent reaching them, the beds be remodeled and enlarged without delay in accordance with plans satisfactory to this Department, or a sufficient number additional evaporators installed to reduce the quantity of liquid reaching the cinder screens to an amount that can be satisfactorily treated by them.

6. That the troughs and pipes leading to the settling tank under the wharf be properly graded to carry the water reaching them without danger of stoppages, and that suitable manholes be provided at frequent intervals in the deck of the wharf over the troughs to afford access to them for inspection and cleaning.

7. That whenever necessary to prevent the escape of sediment or scum from the settling tanks on shore or on the wharf, the sediment or scum shall be removed by a suitable method and disposed of by placing on the scrap or in some other satisfactory manner.

8. That only sanitary or domestic sewage and no trade waste, storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal plant and cesspool intended for the treatment of domestic sewage.

9. That when necessary the sludge from the proposed tank and cesspool for the treatment of the domestic or sanitary sewage shall be removed in such a manner as to cause no nuisance, and finally disposed of by burying in some remote place.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *May* 21, 1920 — *Chief Engineer*

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by sections 76, 78, 79 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to The Fisheries Products Company to discharge the effluents from the proposed works to treat the trade wastes and domestic sewage from their factory into the waters of Gardiner's bay and the ground waters of the State tributary to Gardiner's bay, at the points indicated on the plans on the property of the Fisheries Products Company, within the town of East Hampton, Suffolk county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.

2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.

3. That all the proposed improvements for bettering the sanitary conditions at the fish factory, including pavements, drains, troughs, sewers, sewage and waste disposal works and their appurtenances shown by the plans approved this day, shall be fully constructed in complete conformity with such plans or approved amendments thereof, except where variations are expressly required by the conditions of this permit, and the work completed before the fish factory is put in operation.

4. That no oil, gurry, stick, filter press wastes, or scrap shall be discharged or thrown or allowed to flow or fall into Gardiner's bay or any tributary thereof, or deposited on the ground where it may be washed into Gardiner's bay or any tributary thereof; and that no water or liquid which has drained from or come in contact with any fish, oil, gurry, scrap, or which contains any oil, blood, slime, gurry, scrap, sewage from toilets, sinks, lavatories, or showers or other putrescrible matter shall be discharged or allowed to flow into Gardiner's bay or any tributary thereof, or on to the ground where it may flow into Gardiner's bay or any tributary thereof, except through the outlets shown on the plans approved this day.

5. That the evaporators used for evaporating the fish water be maintained in proper working condition at all times, and that should it be found that the present evaporators have not sufficient capacity to dispose of all the fish water, except such small quantities as for short periods may be taken care of by the cinder screens, additional evaporators be installed with as little delay as possible.

6. That the cinder screens be used only in case of emergency and to treat such small quantities of water as the evaporators may for short periods at times of maximum flow be unable to dispose of, and that the cinders be removed and disposed of in such a manner as to create no nuisance and replaced with new cinders whenever the beds become clogged.

7. That should the cinder screens prove to have insufficient capacity properly to care for the tank effluent reaching them, the beds be remodeled and enlarged without delay in accordance with plans satisfactory to this Department, or a sufficient number additional evaporators installed to reduce the quantity of liquid reaching the cinder screens to an amount that can be satisfactorily treated by them.

8. That the troughs and pipes leading to the settling tank under the wharf be properly graded to carry the water reaching them without danger of stoppages, aind that suitable manholes be proivded at frequent intervals in the deck of the wharf over the troughs to afford access to them for inspection and cleaning.

9. That whenever necessary to prevent the escape of sediment or scum from the settling tanks on shore or on the wharf, the sediment or scum shall be removed by a suitable method and disposed of by placing on the scrap or in some other satisfactory manner.

10. That only sanitary or domestic sewage and no trade waste, storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal plant and cesspool intended for the treatment of domestic sewage.

11. That when necessary the sludge from the proposed tank and cesspool for the treatment of the domestic or sanitary sewage shall be removed in such a manner as to cause no nuisance, and finally disposed of by burying in some remote place.

M. NICOLL, JR.

May 22, 1920 *Deputy State Commissioner of Health*

EAST ROCHESTER

Plans were approved on August 18, 1920, for proposed amendments to the East Rochester sanitary sewer system on Elm, McKinley, Grant, South Washington, and Commercial streets, and on a private right of way between Commercial street and East avenue, in the village of East Rochester. The permit issued in connection with the approval of the plans contained only the usual complete construction and storm water clauses.

GHENT (Town) (District School No. 3)

Plans were approved on May 20, 1920, for the disposal of sewage from the public school in School District No. 3, of the town of Ghent, Columbia county. The disposal plant, according to the plans, is to consist of a settling tank and subsurface irrigation field located on the school property. The permit issued in connection with the approval of the plans follows:

Permit

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Trustees of School District No. 3, town of Ghent, to discharge the effluent from the proposed sewage disposal plant to serve the school in said district into the ground waters of this State tributary to Kline Kill, within the town of Ghent, Columbia county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.
4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal works.
5. That when necessary the sludge shall be removed from the proposed tank in such a manner as to cause no nuisance, and disposed of by burying in some remote place.
6. That no sewage sludge from any part of the disposal works shall be discharged into Kline Kill, or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.
7. That the joints in the drain tile in the subsurface irrigation field be properly protected by tar paper and broken stone or gravel so as to prevent the entrance of sand or loam into the tile and to allow the sewage to pass freely to the soil.
8. That should at any time, due to the increase in the attendance at the school or other cause, the length of tile in the subsurface irrigation field be found insufficient satisfactorily to care for the sewage from the school, additional tile shall be added to the field.

M. NICOLL, Jr.

May 20, 1920 *Deputy State Commissioner of Health*

GREENPORT (Town) (District School No. 1)

Plans for the disposal of sewage from District School No. 1, at Greenport Center, in the town of Greenport, were submitted for approval on September 30, 1920. These plans were returned for revision on October 14, 1920, and the revised plans were approved on October 19, 1920. The plans provided for a disposal plant consisting of a settling tank and a line of field tile connected to a leaching cesspool. The permit issued in connection with the approval of these plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Trustees, School District No. 1, town of Greenport, to discharge effluent from the proposed disposal plant of the school in Greenport Center into the ground waters tributary to the Hudson river, in accordance with the plans accompanying the petition, under the following conditions:

1. That the sewer and disposal plant shown by the plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.
2. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewer and sewage disposal works.
3. That no sewage sludge from any part of the disposal works shall be discharged into the tributary of the Hudson river, or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.
4. That when necessary and not less frequently than once a year the sludge shall be removed from the proposed tank in such a manner as to cause no nuisance, and disposed of by burying in some remote place.
5. That whenever required by the State Commissioner of Health, satisfactory detailed plans for extension of the proposed system or plans for additional works for treatment of the sewage for the school shall be submitted for approval; and upon the approval of said plans any or all portions of such extension or additional works for treatment of sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.
October 19, 1920 *Acting State Commissioner of Health*

HAMBURG

Amended plans for a sewerage system and sewage disposal plant for the village of Hamburg were approved on December 6, 1910. The plans provided for a comprehensive sewerage system and a sewage disposal plant consisting of a settling tank, sprinkling filter, chlorination plant, and final settling tank. The plans also provided for pumping the sewage from about one-half of the village. The above plans were revised and amended and approved by this Department on February 23, 1920. The revised and amended plans contemplated the construction of the sewage disposal plant at a new site and a rearrangement of lines and grades of the sewers to conduct the sewage to the new location. The rearrangement eliminated the main pumping station. The sewage disposal plant remained practically the same as in the original plans. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 77 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Trustees of the village of Hamburg to discharge effluent from the sewage disposal works to be constructed in connection with the proposed sewer system for the village into the waters of Eighteen Mile creek near the proposed disposal works, within the town of Hamburg, Erie county, in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That both the sewer system and the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof, except as otherwise required by this permit.
4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers and sewage disposal works.
5. That no sewage sludge from any part of the disposal works shall be discharged into Eighteen Mile creek or its tributaries, or be deposited upon the ground, where it may be washed by rain or melting snow into Eighteen Mile creek or any other watercourse.
6. That if difficulty is encountered in the proper chlorination of the effluent from the sprinkling filters, the chlorine shall be applied to the effluent from the secondary settling tank.
7. That each unit of the proposed sewage pumping station on Buffalo street shall have a capacity of not less than 50 gallons per minute, and that a duplicate source of power shall be provided for operating the ejectors.
8. That complete detailed plans and specifications for the proposed sewage pumping station shall be submitted to and approved by this Department before the plant is constructed.

M. NICOLL, JR.

February 23, 1920 *Deputy State Commissioner of Health*

Plans were approved on July 1, 1920, for sewer extensions in the village of Hamburg on Crescent avenue and Buffalo street, and for an ejector station to take care of these low lines. The permit issued in connection with the approval of these plans contained, in addition to the usual storm water and complete construction clauses, the following condition:

That the ejector be built and provided for operation in duplicate, and that a manhole be built near the middle of the 600 foot length shown between manholes through private rights of way below Buffalo street.

HAMBURG (Town) (Erie County Agricultural Society)

Plans for the treatment and disposal of sewage from the fair grounds of the Erie County Agricultural Society, in the town of Hamburg, were submitted for approval on August 30, 1920. The plans provided for two separate disposal plants, each consisting of a settling tank and an apparatus for the

sterilization of the effluent with hypochlorite of lime. The plans were returned to the designing engineer for certain modifications. The plans were revised in general accordance with the suggestions of the Department, and were approved on September 23, 1920. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to Erie County Agricultural Society to discharge effluent from the proposed sewage disposal plants to be installed to care for the sewage from the comfort stations at the fair grounds of said society in the town of Hamburg into the waters of a tributary of Rush creek at the point of discharge shown by the plans, within the town of Hamburg, in accordance with the plans accompanying the petition, under the following conditions:

1. That the settling tanks shall be cleaned annually, and that the sludge shall be buried or such disposition made of it as to avoid the creation of any nuisance or menace to health.
2. That no sludge from the settling tanks shall be discharged into Rush creek or any other body of water, or deposited on the ground where it might be washed thereinto by rain or melting snow.
3. That a constant head orifice box be installed, or that the location of the control valve be lowered to a point not more than 6 inches above the ground level, in order that a more uniform application of the solution of hypochlorite of lime may be effected.
4. That on or before June 1, 1921, satisfactory detailed plans for additional works for more complete treatment of the sewage from the fair grounds, such as by sand filtration, shall be submitted for approval; and after the approval of said plans any or all portions of such additional or supplementary works for more complete treatment of sewage shall be constructed and put in operation when required by the State Commissioner of Health.

M. NICOLL, JR.

September 23, 1920 — *Acting State Commissioner of Health*

HAVERSTRAW (Town) (Letchworth Village)

Plans were approved on May 20, 1920, for proposed sewer extensions to serve the Girls' Group at Letchworth village, Thiells. The plans were submitted for approval by the State Architect. No permit was issued in connection with their approval.

HEMPSTEAD (Town) (District School No. 22)

Plans were approved on November 27, 1920, for a proposed sewage disposal plant for the school in School District No. 22, at Floral Park, in the town of Hempstead. The plans provided for the treatment of the sewage in a disposal plant consisting of a sedimentation tank and a series of leaching cesspools. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by article V of the Public Health Law, permission is hereby

given to the Board of Education of School District No. 22, of the town of Hempstead, to discharge effluent from the proposed system of leaching cesspools to serve the school in the village of Floral Park, into the ground waters tributary to the Atlantic ocean, within the town of Hempstead, Nassau county, N. Y., in accordance with the plans accompanying the application, under the following conditions:

1. That the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.
2. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal works.
3. That no sewage sludge from any part of the disposal works shall be discharged into Simonson Pond brook or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.
4. That when necessary, and not less frequently than once a year, the sludge shall be removed from the proposed tank in such a manner as to cause no nuisance, and disposed of by burying in some remote place.
5. That whenever required by the State Commissioner of Health, satisfactory detailed plans for additional series of cesspools or works for the treatment of the sewage for the school shall be submitted for approval; and upon the approval of said plans any or all portions of such additional works for the treatment of the sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.

November 27, 1920 — *Deputy State Commissioner of Health*

JOHNSON CITY

Plans were approved on June 22, 1920, for sewer extensions in Massachusetts avenue, Cook street, Crocker avenue, Main street terrace, Cleveland and Endicott avenues, and Broad street, in the village of Johnson City. On November 24, 1920, plans were approved for sewer extensions in Bernice, Brown, Burns, Carlton, Olive, Sturtevant, and Thomas streets, and Grand avenue, in the village of Johnson City. The permits issued in connection with the approval of these plans follow:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 77 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Trustees of the village of Johnson City to discharge sewage from the proposed sewer extensions in Massachusetts avenue, Cook street, Crocker avenue, Main street terrace, Cleveland and Endicott avenues and Broad street, into the waters of the Susquehanna river through the present outfall sewer at the Delaware, Lackawanna and Western Railroad bridge, within the town of Union, Broome county, N. Y., in accordance with the plans accompanying the petition under the following conditions:

1. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewer extensions.
2. That a manhole be constructed at once to or near the surface of the ground, where a manhole foundation is shown on the plans, immediately below the creek crossing on Broad street.

3. That all the work shown on the plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof, except as to condition 2 above.

4. That whenever required by the State Commissioner of Health, the sewage to be collected by the proposed sewers shall be conveyed to and treated in sewage disposal works to be constructed jointly by the village of Johnson City and the city of Binghamton, or by the village of Johnson City alone, to care for the entire sewage of the village, under plans to be submitted to and approved by this Department.

M. NICOLL, JR.
June 22, 1920 *Deputy State Commissioner of Health*

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by article V of the Public Health Law, permission is hereby given to the Board of Trustees of the village of Johnson City to discharge sewage through the proposed sewer extensions in Bernice, Brown, Burns, Carlton, Olive, Sturtevant, and Thomas streets and Grand avenue, in the village of Johnson City, into the waters of the Susquehanna River through the present outfall sewer at the Delaware, Lackawanna and Western Railroad bridge, within the town of Union, Broome county, N. Y., in accordance with the plans accompanying the application, under the following conditions:

1. That the iron pipe sewer crossing of the open ditch on Burns street be either so arranged that the pipe will be enveloped in and rigidly supported by properly reinforced concrete and so that it will not materially reduce the carrying capacity of the drainage ditch; or that it be so arranged as to pass beneath this ditch in an inverted siphon and provided with additional manholes at each end just above and below the ditch.

2. That the elbow at the lower end of the descending inflow pipe at the drop manhole be either surrounded by the masonry of the manhole or be made of iron resting upon the manhole base extended.

3. That the sewer extensions shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof with the exception of the two above conditions.

4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewer extensions.

5. That whenever required by the State Commissioner of Health, the sewage to be collected by the proposed sewers shall be conveyed to and treated in sewage disposal works to be constructed jointly by the village of Johnson City and the city of Binghamton, or by the village of Johnson City alone, to care for the entire sewage of the village, under plans to be submitted to and approved by this Department.

M. NICOLL, JR.
November 24, 1920 *Deputy State Commissioner of Health*

LAKE PLACID

Plans were approved on January 26, 1920, for a sewer in Main street, in the village of Lake Placid. The permit issued in connection with the approval of the plans contained only the usual revocation, modification, complete construction, and storm water clauses.

LARCHMONT

Plans for sewer extensions in Ocean and Linden avenues, in the village of Larchmont, were approved on April 19, 1920. The permit issued in connec-

tion with the approval of the plans contained, in addition to the usual revocation, modification, complete construction, and storm water clauses, the following condition:

That whenever required by the State Commissioner of Health, the sewage disposal plants for the treatment of the sewage of the village shall be constructed in accordance with the plans approved by this Department on March 2, 1917, and the provisions of the permit issued on the same date in connection with the approval of the plans, and in accordance with plans subsequently approved and permits subsequently issued by this Department.

LIBERTY (Town) (Loomis Sanatorium)

Revised plans for a sewerage system and sewage disposal plant to serve the Loomis Sanatorium, in the town of Liberty, Sullivan county, were approved on March 12, 1920. The report upon the examination of the plans and the permit issued in connection with the approval of the plans follow:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on the examination of revised plans for a sewerage system and sewage disposal plant to serve the Loomis Sanatorium, in the town of Liberty, Sullivan county, N. Y., submitted to this Department for approval by the designing engineers on March 9, 1920.

The Loomis Sanatorium, an institution for the treatment of tuberculosis, is located about three miles west of the village of Liberty, and occupies about thirty buildings scattered over a large area sloping to the south and toward Swan lake. According to the report of the designing engineers, the total population of the institution at the present time is 335, but in designing the sewage disposal plant the engineers have provided for a population of 400.

The sanatorium is at present served by three separate sewage disposal plants which are not giving entirely satisfactory results. A description of these plants will be found in a report on the water supply and sewage disposal of the institution submitted to you under date of June 18, 1919. Plans for a sewerage system and sewage disposal plant to serve the entire institution were submitted to this Department for approval on November 7, 1919. These plans were examined, and a report recommending that certain modifications be made in the design was submitted to you under date of November 21, 1919. The plans have been revised in general accordance with these recommendations and have now been resubmitted to this Department for approval. These revised plans contemplate the construction of a sewerage system for collecting the sewage from all the institution buildings that are equipped with plumbing fixtures, and a sewage disposal plant, consisting of a settling tank, sludge bed, dosing chamber, and intermittent sand filters for treating the sewage so collected.

The sewerage system will consist of a trunk sewer about 4,940 feet long, comprising 360 feet of 4-inch pipe, 3,955 feet of 6-inch pipe, and 325 feet of 8-inch pipe, and a number of laterals or house sewers. The larger part of the trunk line, which lies above the waterworks of the institution, is to be of castiron pipe laid with lead joints in order to prevent the possible contamination of the water supply by leakage from the sewers. The grades will in general be sufficiently steep to produce satisfactory self-cleansing velocities if the sewers are properly laid, the minimum grade being 2 per cent. The average depth of the trunk line will be about 6 feet. Manholes are to be provided at frequent intervals and at all changes in grade and alignment except at stations Nos. 10 and 19, where changes in grade are indicated between manholes. This undesirable condition can apparently be easily corrected at station No. 10 by relocating the manhole and connecting line just below this point, and at station No. 19 by straightening the grade, which will involve only a slightly deeper cut for a short distance. Unless some conditions exist that are not shown on the plans, this should be done.

Twenty-eight buildings will be connected to the trunk line by lateral sewers consisting largely of lines of 4-inch castiron pipe. Two lateral lines, both of which are below the waterworks, are to be of 6-inch tile pipe. The grades of the laterals are not given in detail, but judging from the slope of the ground will apparently be satisfactory. The lines should have a slope of not less than 2 per cent.

The settling tank is to be a concrete structure covered with a one-story frame building. It will be divided by a longitudinal concrete partition into two separate compartments each 10 feet by 34 feet in plan and 10 feet 6 inches deep from the flow line to the bottom of the hopper bottom. The capacity of each compartment will be 19,000 gallons, making the total capacity of the tank 38,000 gallons, the equivalent of about 25 hours average flow based on a population of 400 and an assumed sewage flow of 100 gallons per capita per day. Transverse masonry walls will be built across each compartment of the tank at its middle. The lower half (3 feet) of this wall will be of open brickwork to allow the liquid to pass from the first into the second section formed by the transverse wall. An 8-inch circular overflow will be provided through the wall above the flow line. One hopper, the flattest side of which has a slope of 6 on 10, forms the bottom of each section. A diverting manhole fitted with shear gates will be provided just outside of the inlet end of the tank arranged so that sewage may be admitted to either or both of the compartments of the tank.

The sewage will enter the tank through 8-inch Ts extending 3 feet below the flow line of the tank and located at the center of the inlet ends of the compartments, pass under concrete baffles set 6 feet from the inlet end, and extending from 6 inches above to 4 feet 6 inches below the flow line; then through the open parts of the transverse partitions which extend from 3 feet below the surface to the top of the hopper bottoms, which are 6 feet below the surface; then through the second sections of the compartments and under concrete baffles similar to those near the inlet ends set 5 feet from the outlet ends, and out of the tank through 8-inch Ts at the centers of the outlet ends of the compartments. The function of the transverse partitions is not entirely apparent; and while they will probably have little effect on the operation of the tank, their construction seems unnecessary. The baffles are to be placed farther from the ends of the tank than is usually customary, and would probably serve their purpose better if placed nearer the end walls of the tank. The outlet pipes of the two compartments of the tank join in a Y a few feet beyond the outlet end of the tank. The grade of the pipes to this Y is not definitely indicated, but should be sufficiently steep to prevent the sewage from flowing from one tank to the other should the level in one tank be drawn down.

Six-inch sludge draw-off pipes will be provided, connected to the bottom of each hopper for discharging the sludge onto the sludge beds. The outlet branches of these pipes will be 3½ feet below the normal level of the liquid in the tank, and the fall from the tank to the sludge beds which are located 120 feet from the tank will be 11 feet.

The sludge beds will be two in number, each 15 feet by 20 feet in plan, making their total area 600 square feet, or the equivalent of 1.5 square feet per capita, an area which is somewhat less than is usually considered advisable for use in connection with tanks of the type proposed, and which will require that the sludge be drawn off frequently and the beds well taken care of if satisfactory results are to be obtained. The beds are to be made of 4 inches of sand placed on a layer of broken stone varying from 6 inches to 12 inches in depth. The sludge will be discharged on to the beds through two 6-inch valves, one located at a corner of each bed. The plans do not indicate that any means will be provided to prevent the incoming sludge from washing away the sand near the inlets and finding its way directly into the broken stone and underdrains. It would seem desirable that some means, such as the construction of aprons under the inlets, should be provided to prevent this. The sides of the beds are planked to a height of 8 inches above the surface of the filter. The effluent from the beds will be collected by 4-inch tile underdrains 10 feet on centers, and conducted to a main 4-inch drain which will carry it to the dosing chamber of the sand beds.

The dosing chamber is to be a concrete tank 16 by 16 in plan and will be covered with a one-story brick house. The depth of the tank below the water line will be 3 feet, making its available capacity 5,700 gallons, the equivalent of about 3.4 hours average flow or a depth of about 1⅛ inches on one sand bed. The chamber is to be equipped with four automatic siphons arranged to discharge the contents of the dosing chamber onto each of the four sand beds in turn, making the average time between dosings on each bed about 14 hours. The size of the siphons is not given, but according to the scale is about 6 inches. In order effectively to flood beds of the size proposed, the siphon discharges should be at the rate of approximately 730 gallons per minute. With an average head of about 21 inches as provided in this case, this would require 8-inch siphons.

The sand beds, four in number, are each to be 90 feet by 90 feet in plan, making the total filter area 32,400 square feet, or approximately 0.75 of an acre. With the estimated population of 400, and an assumed sewage flow of 100 gallons per capita per day, the rate of filtration will be 53,300 gallons per acre per day. The beds will be made of 3 feet of sand and placed on 6 inches of medium broken stone, which in turn will rest upon a layer of larger broken stones varying from 0 to 6 inches in depth. The size and character of the sand is not given. To assure satisfactory results the sand should have an effective size of not less than 0.2 millimenter, nor greater than 0.45 millimeter, preferably about 0.3 millimeter and should be free from clay, loam, or material likely to decompose. The uniformity coefficient should be less than 5. Three parallel wooden troughs 6 by 8 inches in size, provided with 1-inch holes 4 feet apart along each side, will be placed on each bed about 30 feet apart, for distributing the sewage. Four-inch tile drains, 18 feet on centers, laid in the coarse broken stone under the beds will be provided for collecting the effluent and conducting it to the 8-inch main effluent pipe. This pipe discharges on the property of the sanatorium into a small stream tributary to Swan lake, at a point about 2½ miles from the lake. The outlet of this lake is Mangaup river, which flows in a southerly direction about 25 miles and empties into the Delaware river. There is no water supply taken from Mangaup river below the point of discharge of the sewage effluent.

In view of the results of our examination of these plans, and after a careful consideration of the essential features of the design and of local and general conditions, I would recommend that the plans be approved, and a permit issued to the Loomis Sanatorium allowing the discharge of the effluent from the proposed sewage disposal plant to serve the sanatorium, into a tributary of Mangaup river on the property of the sanatorium, in the town of Liberty. I would further recommend that in addition to the usual revocation, modification, complete construction, and storm water clauses, the permit contain the following conditions:

1. That there shall be no change in grade or alignment between the manholes on the trunk sewer.
2. That the dosing tank siphons shall be not less than 8 inches in size.
3. That the sand used in the construction of the filter beds shall be clean, free from loam, clay, or readily decomposable matter, and shall have an effective size of not less than 0.2 m.m or more than .45 m.m., and a uniformity coefficient of not more than 5.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *March* 11, 1920

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the

Loomis Sanatorium, town of Liberty, to discharge the effluent from the proposed sewage disposal plant to serve the sanatorium into a tributary of Mangaup river on the property of the sanatorium, within the town of Liberty, Sullivan county, in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That both the sewer system and the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.
4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal works.
5. That no sewage sludge from any part of the disposal works shall be discharged into any tributary of Mangaup river or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.
6. That there shall be no change in grade or alignment between the manholes on the trunk sewer.
7. That the dosing tank siphons shall be not less than 8 inches in size.
8. That the sand used in the construction of the filter beds shall be clean, free from loam, clay, or readily decomposable matter, and shall have an effective size of not less than 0.2 millimeter or more than .45 millimeter, and a uniformity coefficient of not more than 5.

M. NICOLL, JR.

March 12, 1920 *Deputy State Commissioner of Health*

Amended plans for the proposed sewage disposal plant to serve Loomis Sanatorium were approved on April 8, 1920. The plans proposed to substitute a two-story settling tank for the plain settling tanks, and left the sewerage system and the remainder of the sewage disposal plant as shown on the original plans. The sewage disposal plant as provided for by the new plans will consist of a two-story settling tank, sludge beds, and intermittent sand filters. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Loomis Sanatorium, town of Liberty, to discharge the effluent from the proposed sewage disposal plant to serve the sanatorium into a tributary of Mangaup river on the property of the sanatorium within the town of Liberty, Sullivan county, in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.

3. That both the sewer system and the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.

4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal works.

5. That no sewage sludge from any part of the disposal works shall be discharged into any tributary of Mangaup river or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.

6. That there shall be no change in grade or alignment between the manholes on the trunk sewer.

7. That the dosing tank siphons shall be not less than 8 inches in size.

8. That the sand used in the construction of the filter beds shall be clean, free from loam, clay, or readily decomposable matter, and shall have an effective size of not less than 0.2 millimeter or more than .45 millimeter, and a uniformity coefficient of not more than 5.

M. NICOLL, JR.
April 8, 1920 *Deputy State Commissioner of Health*

MAMARONECK (Town) (Sewer District No. 1)

Plans were approved on July 15, 1920, for a sewer system for Sewer District No. 1, in the town of Mamaroneck, Westchester county. The report upon the examination of the plans, together with the permit issued in connection with their approval, follow:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on the examination of general plans for sewerage for Sewer District No. 1, in the town of Mamaroneck, Westchester county, N. Y., submitted by the board of sewer commissioners to this Department for approval on June 15, 1920, together with the report of the designing engineer and the application for a permit. A field inspection of this district was made by an engineer of the Department on June 20, 1920, and additional information was submitted by the engineer of the district, at the request of the Department, on June 30, 1920.

Sewer District No. 1 of Mamaroneck has an area of 356 acres, and lies in the southwestern part of the town, and with its western boundary forming a common boundary with that of the city of New Rochelle. In general outline the form of the district resembles an inverted letter Y, with the stem pointing slightly west of north, and with the village of Larchmont reaching up between the branches and separating their lower extremities from Long Island sound. The upper or northerly section is very hilly and wooded. The east section is suitable for a closer development, but much of the southerly section is low and less desirable for settlement, so that while the present population of under 600 was found to be greatly in need of sewers, provisions for an ultimate population greater than say 7,000, or 20 persons per acre, seems unnecessary.

The records of this Department show that on March 2, 1917, plans for a disposal plant for the village of Larchment were approved, and the plans now submitted show that it is intended to discharge the sewage tributary to this proposed sewerage system through the present and proposed system of sewers of Larchmont and through this disposal plant. However, a proposed preliminary treatment is indicated by locations being shown for two Imhoff tanks in residential sections of Mamaroneck — one above the railroad, and another on the Larchmont village line near the houses of the growing settlement in that village along Forrest Park avenue. From letters of the engineer dated June 9, 26, and 29, 1920, and the engineer's report of June 10. 1918, submitted with the plans, it appears that before the construction of

the sewers on any particular street or series of streets the engineer will make the usual large scale plan and profiles of the particular work contemplated and submit the same to the Department for approval, and that where sewers are shown through private land the intention is to acquire rights of way 10 feet or more in width. The last letter of the designing engineer referred to gives a few essential cuts, diameters, and grades which were requested by the Department since they were not shown on the plan. The engineer's letters and report also state that the board of trustees of Larchmont village, who have had joint meetings with the board of sewer commissioners of District No. 1 of Mamaroneck, insisted on Imhoff tanks being provided by this district on each of the two principal incoming sewers from Sewer District No. 1 of the town of Mamaroneck.

The attitude of the Department on this matter was referred to in a previous report, and it should not be difficult for the parties concerned to make a prompt and equitable agreement for the logical plan of treatment of the sewage of the town sewer district and the Bonnett avenue sewer district at one point instead of ineffective and uneconomical duplication of sewage disposal plants. If the sewage from the town sewer district were treated at the points indicated by the plans, the partially treated sewage would be immediately mixed with the raw untreated sewage of the village when discharged into the Larchmont sewers. Furthermore, such partial treatment of the sewage of the town would not materially affect the efficiency or the size of the Bonnett avenue plant for the joint treatment of the sewage from the town and village districts tributary to it, and the cost of construction and maintenance of three plants would be much greater than the construction and up-keep of one joint treatment plant near the harbor as originally planned. I am of the opinion, therefore, that permission should not be granted to the sewer commissioners of Sewer District No. 1 of the town of Mamaroneck to treat the sewage from this sewer district in individual sewage disposal plants before such sewage is discharged into the Larchmont sewer system.

The connections between the sewers of District No. 1 of Mamaroneck and those of Larchmont are made at three points. The sewage from about 290 acres is to cross the town line in an 18-inch pipe on a 0.25 per cent grade under the railroad on the line of Cedar street, Mamaroneck, prolonged; the sewage from about 58 acres is to cross the town line in a 10-inch pipe on an 0.5 per cent grade on the line of Forrest avenue, Larchmont, prolonged; and the sewage from about 5 acres on the north side of the Post road, and from about 3 acres on the south side of the Post road, in 8-inch pipes on 0.5 per cent grades. These sewers give a total combined outlet capacity sufficient for several times the ultimate population to be expected in the district.

The principal or 18-inch connection between the town and the village is shown on the approved village maps and mentioned in report on proposed sewers for Larchmont of April 4, 1918, and is also shown and described on a map attached to a plan for sewer extensions in Larchmont approved by this Department December 4, 1919. It has a capacity of about 5 second feet, indicative of a preparation on the part of the village to receive from the town a flow from a population of some 15,000 persons. Therefore it is apparent that this Department as well as the village and town authorities continuously held in mind a connection of sufficient magnitude to embrace the territory now occupied by under 600 persons with an ultimate population of but about one-half that for which preparations have been arranged for in advance.

The sewage from the entire sewer district, except from a small area in the southwesterly portion of the district marked I-A.M.L., naturally drains toward the village of Larchmont, and as noted is to be discharged by gravity flow into the trunk sewer of the so called Bonnett avenue sewer district of the village of Larchmont. The sewage from district I-A.M.L. is to be collected at a pumping station near the lower end of Fifth avenue, from which it is to be pumped into the gravity system at the intersection of Murray avenue and Beech street. Detailed plans of the pumping station and force main of this district have not been prepared or submitted, as it is expected by the

sewer commissioners that it will be a considerable time before this area will be developed and require sewers. Before the pumping station and force main are installed, however, satisfactory detailed plans for these structures should first be submitted to and receive the approval of this Department.

The plans of the proposed sewer system now submitted comprise a general plan in duplicate, but it is not accompanied by profiles, and no drainage lines or contours are given to facilitate the examination of the plans. The plan shows an area about 1,400 feet by 2,800 feet in transverse diameters without elevations. The field inspection showed the feasibility of sewering this area into the proposed system and revealed the nature of the territory. It, however, also brought to light that while the legend on the plan showed that dotted lines were to be used to indicate ungraded streets, many streets shown in solid lines had no existence on the ground.

The entire system of sewers shown are 8-inch and of suitable larger diameters up to 18-inch. They are designed with slopes that will give self-cleansing velocities if properly constructed. Flush tanks are shown at their dead ends, and manholes at angles and throughout at intermediate points at distances of about 300 feet apart. All points, including the lowest points in the area of the district where no sewers are shown, are so situated and of sufficient elevation to permit their being reached by gravity extensions from the proposed system.

After a careful examination of the plan and report submitted, and a full consideration of the local aspects on the ground and of the features of design, I would recommend that the plans be approved, and a permit be issued to the sewer commissioners of Sewer District No. 1 of the town of Mamaroneck allowing the discharge of sewage from the sewer district into Larchmont Harbor, through the outlet sewer of Sewer District No. 1 of the village of Larchmont. I would further recommend that the permit contain the following conditions

1. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewer and disposal works.
2. That before any sewers are constructed in Sewer District No. 1 of the town of Mamaroneck, a copy of the agreement between the board of trustees of the village of Larchmont and the sewer commissioners of said sewer district, for the joint treatment of the sewage of Sewer District No. 1 of the town of Mamaroneck and the sewage of the village of Larchmont tributary to the Bonnett avenue outfall sewer, shall be submitted to this Department.
3. That before the pumping station and force main for subdistrict I-A.M.L. are constructed, detailed plans for said pumping station and force main shall be submitted to and receive the approval of this Department.
4. That before any of the sewers not shown in detail by the approved plans are constructed, satisfactory detailed plans of said sewers shall be submitted to and receive the approval of this Department.
5. That whenever required by the State Commissioner of Health, the sewage to be collected by the proposed sewers of this sewer district shall be passed through the Bonnett avenue sewage disposal plant of the village of Larchmont, which plant shall be constructed and put in operation whenever required by said Commissioner.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *July* 14, 1920

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 77 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the

sewer commissioners of Sewer District No. 1 of the town of Mamaroneck to discharge sewage from this sewer district into the waters of Larchmont Harbor through the outlet sewer of Sewer District No. 1 of the village of Larchmont, within the village of Larchmont, Westchester county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers.
2. That before any sewers are constructed in Sewer District No. 1 of the town of Mamaroneck, a copy of the agreement between the board of trustees of the village of Larchmont and the sewer commissioners of said sewer district for the joint treatment of the sewage of Sewer District No. 1 of the town of Mamaroneck and the sewage of the village of Larchmont tributary to the Bonnett avenue outfall sewer, shall be submitted to this Department.
3. That before the pumping station and force main for subdistrict I-A.M.L. are constructed, detailed plans for said pumping station and force main shall be submitted to and receive the approval of this Department.
4. That before any of the sewers not shown in detail by the approved plans are constructed, satisfactory detailed plans of said sewers shall be submitted to and receive the approval of this Department.
5. That whenever required by the State Commissioner of Health, the sewage to be collected by the proposed sewers of this sewer district shall be passed through the Bonnett avenue sewage disposal plant of the village of Larchmont, which plant shall be constructed and put in operation whenever required by said Commissioner, or that said sewage shall be intercepted by intercepting sewers and treated in sewage disposal works to be constructed by Sewer District No. 1 of the town of Mamaroneck in accordance with plans which shall first be submitted to and approved by the State Commissioner of Health.
6. That no sewage disposal works shall be installed at the points indicated by the approved plans without the approval of this Department.

M. NICOLL, JR.
July 15, 1920 *Deputy State Commissioner of Health*

MARCY (Town) (Utica State Hospital)

On August 9, 1920, plans for water supply distribution system and sewerage and sewage disposal systems for the Marcy Division of the Utica State Hospital were approved. The report upon the examination of the plans for sewerage and sewage disposal follows, in part:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on the examination of Specification No. 2387, and Drawings Nos. 2089 to 2096, inclusive, and Drawing No. 1058, covering sewerage and sewage disposal systems for the Marcy Division of the Utica State Hospital, in the town of Marcy, Oneida county, N. Y., submitted to this Department for approval by the State Architect on July 10, 1920.

Previous Sewer and Disposal Plans

The records of the Department show that on July 22, 1917, preliminary plans for the collection and disposal of the sewage of this hospital were approved on the condition that final and detailed plans were to be presented before the construction of the work. These original plans provided for an immediate population of 3,000 persons and an ultimate population of 5,000. It was later decided to modify the original plans, and in this connection several conferences were held with the representatives of the State Architect

by the engineers of this Department between October 2, 1918, and April 9, 1920, inclusive, in which details of a plant smaller in both the present and future capacity were gone into at considerable length.

State Architect's Report

The letter from the State Architect submitting the present plans and specifications states that the Marcy Division of the Utica State Hospital is to be a hospital for the insane; that it is now under construction, contracts for the four buildings for immediate installation having been let; and that sewer and water connections are shown for two other buildings, which buildings are shown but are not to be built at present. The letter further states that two of the four buildings planned for immediate construction are to be chronic patient buildings, and are designed to care for approximately 300 inmates each. Another one of these four buildings is to be an acute patients building, and is designed to care for approximately 200 inmates. The total population which will be cared for in the buildings now under contract is stated to be less than 1,000, and the estimated ultimate population of the institution when completed at some future date in accordance with present plans is stated to be approximately 3,000.

General Location

The property of the State upon which this proposed hospital is located lies about 5 miles by rail west of Utica, between the Mohawk river on the southwest and the Rome, Watertown and Ogdensburg Railroad on the northeast. The property is nearly rectangular in general form with sides about 1½ miles in length. It slopes rapidly up a 100-foot rise from elevation of about 440 feet above mean sea level, along the Barge canal, which lies between the property and the Mohawk river, and then slopes more gently back across a highway which runs in general parallel to the canal and the railroad, to where nearly a mile beyond the highway the property reaches a summit elevation of about 630 feet.

Buildings Served

The power house of the institution shown by the plans, and which comprises the fourth building under construction, is located on a railroad spur where the side of the short slope toward the railroad levels out about 400 feet from the railroad station. The building for acute patients is about one-half mile, measured at right angles to the railroad, back from the depot, and nearly as far from the highway mentioned which traversed the other side of the property above the crest of the slope near the canal. The two buildings for chronic patients are symmetrically placed on each side of a line between the first two buildings, and distant about 1,000 feet from each other and from the building for acute patients.

Sewerage and Sewage Disposal

The plans for sewerage and sewage disposal have been carefully examined with respect to the sewer system and sewage disposal works. In connection with the sewerage system, the design has been carefully studied with reference to alignment, sizes, grades, capacities, facilities for cleaning and inspection, and other features of a hydraulic or sanitary nature. In connection with means for sewage disposal, it has been studied with reference to general method and efficiency of the sewage disposal plant as a whole, and of the capacities, and practical construction and operation of the individual structures, appurtenances, and apparatus, and suitability of the point of discharge.

Sewerage System

The sanitary sewage is all collected and flows to and through the disposal works by gravity, except the sewage from the power house and two or three adjacent buildings, which sewage it is planned to pump at the power house up over the ridge where it enters into the gravity system at its nearest but highest point. The outfall sewer is 15-inches in diameter and about ¾ of a

mile long, extending to the disposal plant at the foot of the bank above the canal about 900 feet from the road and 700 feet from the nearest house.

The sewage pump well and pumping equipment is shown on the plans for the new heating and lighting plant for the institution, and is located near the middle of the northerly side of this building which is nearly 300 feet long. The bottom of both the receiving well and dry pump well are 16 feet below ground floor level and 6 feet below the level of the motor room floor. Two horsepower induction motors are provided with automatic float and switch starters, and appear ample to operate the pumps at the specified 200 gallon per minute rate against a 40-foot head. The 3-inch direct connected centrifugal pumps which lift the sewage through 600 feet of 6-inch castiron force main are protected by a removable bar screen of 2-inch by ¼-inch bars 1 inch apart placed in the receiving well. The pumps are to have a maximum static suction head of 2 feet and a static discharge head of 30 feet.

The receiving well is located just outside the wall line of the building and is constructed of concrete, as is also the pump well. The sanitary sewage from the building itself, as well as from a proposed incoming 6-inch sewer from the mortuary shops and cottages, which is not shown in detail, are to be discharged into the receiving well, which extends up to the level of the ground floor of the building. The building sewer enters the receiving well at about elevation 601, while that from the cottages enters about elevations 592, though the nearest future building shown is 550 feet away and has a ground elevation of 600, so that it would appear that this intake might be raised several feet if basement fixtures were omitted.

The scaled horizontal dimensions of the pump well are approximately 5½ by 8 feet, giving it a capacity of 330 gallons per foot of depth. Therefore the effective receiving well capacity seems to be sufficient for the service now planned. The well floor is but 2.58 feet on the average below the incoming cottage sewer mentioned, which leaves a useful capacity of 850 gallons.

Sewer Details

In detail, the sanitary sewers gradually increase in size from 6 inches to 15 inches as they descend toward the canal without reduction at any point and appear to be of ample capacity to prevent undue clogging and to permit the passage of sewage. The slopes are not shown at all, and the sizes are not given on the profiles, but the computation from the elevations shown at manholes indicates that all the sanitary sewers have been given sufficient slopes to produce self-cleasing velocities. All sewers are of vitrified pipe except the 600 foot 6-inch force main delivering sanitary sewage from the power house, and about an equal length of 12-inch effluent pipe from the disposal plant to the canal, which are to be of castiron.

The alignments of the sewers are chosen with a view to minimizing the cuts, which vary between 4 feet and 17 feet. It is recommended that, particularly at great depths, tight joints be insisted on, and that under such ground water and earth pressures particular attention be given to solidifying the supporting backfill beneath and beside the pipes.

Sewer Appurtenances and Features

Manholes are to be placed at each point of change in direction in line, and at distances not greater than 400 feet apart. The only unusual features in the system are the submerged effluent discharge pipe, which in some ways resembles an inverted siphon; frequent 6-inch and 8-inch plugged openings or sleeves provided for future connections at manholes, for the many future buildings shown on them in faint outline; and the systems being so planned that all the sanitary sewage from these buildings can drain by gravity into the present system.

A commendable feature of the specifications is the requirements that a trial run of a week's duration shall precede acceptance of the sewer system and disposal plant from the contractor.

Treatment and Disposal

The sewage disposal plant for the treatment of sanitary sewage of the institution is to consist of screening chambers in duplicate, preliminary settling tanks of the two-story type in duplicate, dosing tank and apparatus, sprinkling filter, final settling tank, and chlorination building and apparatus, with auxiliary beds for the treatment of sludge. The effluent from this plant is planned to be discharged into the canal through about 600 feet of 12-inch pipe at a point approximately 1,200 feet northwesterly from the Crane Creek canal spillway, and about 1,800 feet from the highway traversing the property.

Effluent Dilution

The portion of the canal into which the effluent is to be discharged is fed by waters from wide adjoining slopes, and more largely by water from Nine Mile, West Canada, and Marcy or Crane creeks, the Mohawk river, the Black River canal, and old Erie canal feeders, in all about 10 or 15 comparatively adjacent sources. It thus affords ample dilution of the effluent, is of exceptionally dependable volume and uniformity of flow, and is moreover relatively free from danger of back water obstruction. In addition, it has the further advantage of not being used adjacently or elsewhere below to any considerable extent as a source of public water supply. It is, however, occasionally used above for the disposal of sewage and trade waste directly or indirectly, as from Rome, and from the Fibre Company at Hinckley, and from sanitary wastes entering it through its feeders.

Disposal Plant Site

The site chosen for the disposal plant is where abundant fall is available, between contours 440 and 470 on the lower portion of the slope above the canal and about midway between the latter and the highway. Ample suitable land for expansion is available on all sides. While the plans show 6 or more buildings, apparently houses, adjoining the highway within 1,000 feet or less of the plant, the nearest is about 800 feet distant. This house is, besides, 60 feet higher in elevation and back from the brow of the hill, and above the point where the road turns southward and descends the latter. This turn in the road brings one or more of the houses on it and the road itself seemingly more within sight of the disposal plant. On this account it is suggested that the placement of some screen, of not too close or dense a nature as of trees, on the southeasterly side of the plant and between it and the canal, might be considered, holding in mind the avoidance of any restriction of possibilities for future extension.

Character and Amount of Sewage

No trade waste and no rain water or drainage, but only sanitary sewage from the hospital buildings and their toilets, kitchens, laundries, etc., are carried by the sewers for treatment in the disposal plant. The sanitary sewage will reach the disposal plant in general in an exceptionally fresh state, none, with the exception of a small portion to be pumped from the power house, being over one hour old. The amount of sanitary sewage to be provided for from all the buildings now under contract for construction is that from 1,000 persons, or an average flow of 100,000 gallons per day. A maximum hourly rate of flow of 251 gallons per capita per day, giving a maximum rate of 215.000 gallons per day, or ⅓ second foot, for very short periods during certain days, may be anticipated to obtain at institutions such as that at Marcy.

Disposal Works Details

The outfall sewer discharges into the screen chamber which adjoins the primary settling tanks. This chamber is supported by a 12 inch reinforced concrete slab, and is subdivided by 12 inch concrete walls into a distribution manhole and duplicate screen chambers. It is about 7 feet wide by 11 feet long and 4 feet deep in gross interior dimensions, with a hydraulic depth of 1.08 feet and gross combined sewage capacity of 500 gallons. The impounding

of the water in this manhole and these tanks to a depth of 1.08 feet gives the incoming sewage a hydraulic cross section of 4.32 square feet, which for an average flow of 100,000 gallons per day gives a velocity of but ⅙ of the previous self-cleansing velocity in the pipe.

This check in velocity will lead to the rapid formation of deposits. Ordinarily a hopper bottom drained through a valve and pipe on a steep slope to a suitable filter might seem desirable; but it is understood that in an institution of this character daily or frequent hand cleaning and consequent examination is desirable and assured. In construction in placing the screen and embedding any frame of the hinged doors, it is particularly recommended that nothing be left which will obstruct a smooth continuous raking surface from the bottom of the screen up on to the top of the screen chamber.

Primary Tanks

The primary settling tanks, which are to be of the two-story type, are to be of reinforced concrete. Each tank is to be 14 feet wide by 29 feet 4 inches long, with a maximum hydraulic depth of 24 feet 6 inches and a total depth of 28 feet. The side walls are 1 foot 4 inches in thickness, but the hopper bottoms, which may be subjected during construction or later to reversed and unequal stress, are but 6 inches thick, and reinforced against external pressure or flotation only by but 4 per cent volume, or 0.9 pound per square foot, of fabric reinforcement. While it is believed these bottoms may not leak or give trouble, yet the construction of them between 20 and 30 feet below ground surface seems to contrast with the heavily reinforced walls of the upper partition walls where pressure from both sides is equal and uniform.

Sewage is admitted in one end of the primary settling tanks and passes out from the other over the level edges of reinforced concrete gutters on each end, which are protected from scum by a 2 foot 3 inch reinforced concrete baffle 4 inches thick extending 1 foot above water surface. Each primary settling tank has a total capacity of over 50,000 gallons. Of this the inner or upper chamber contains 20,000 gallons. This upper chamber is 10 feet wide by 12 feet 6 inches deep below the water line, and slopes 1½ on 1 to a 6 inch slot at the bottom, which has a lip so projecting as to prevent the entrance of any bubbles or rising particles from the under tank. The capacity of the upper tanks provides a seemingly satisfactory settlement or subsidence detention period. With one tank in use, this would be 5 hours for 100,000 gallons a day, or, with both tanks in operation, of between 3 and 4 hours for a rate of 300,000 gallons a day.

Sludge Tanks

The available combined sludge storage space of both tanks, measured beneath a plane taken 1 foot below the bottom of the slot, is about 40,000 gallons, or about 13 gallons per capita for a population of 3,000, which appears sufficient. Lead pipes for facilitating sludge removal are shown, but no water supply for the plant appears to be provided. The mains of the institution water supply should be extended to the disposal plant, or an independent water supply should be provided for use at the disposal plant.

Siphon Chamber

The siphon chamber is of concrete adjoining the ends of the settling tank. It is 10 feet long by 5 feet wide with the two end walls sloping to the bottom, which is 5 feet square and 6 feet below the water surface. This chamber is to be provided with a 12 inch automatic siphon which is to discharge the contents of the tank in doses of about 2,000 gallons to the sprinkling filters through a 14 inch main castiron distributing pipe, the volume depending on the inflow during siphonage and whether one or both tanks are connected. The siphon chamber is provided with a drain, and is so arranged as to receive the effluent from either or both tanks. It is made accessible by hinged wrought-iron doors placed on the top 3 feet 6 inches above the water level. A 12 inch by-pass is to be provided around the dosing tanks from each pre-

liminary settling tank. These by-passes are to be connected with the main distribution of the sprinkling filter, and it is assumed that they are to be used only in case of emergency.

Sprinkling Filter

The sprinkling filter is 98 feet by 111 feet in plan, or ¼ acre in area, with a depth of 7 feet, giving it a content of 1¾ acre feet of filtering material. For a flow of 100,000 gallons per day, it will give a rate of only 57,000 gallons per acre foot per day, or with a flow of 300,000 gallons per day, a rate of 171,000 gallons per acre foot per day, rates apparently well within permissible lines. The filter sides are composed of extremely heavy unventilated walls of concrete. The bottom is of concrete 6 inches to 12 inches thick on a cinder fill. The filter is to be drained by gutters formed in the concrete bottom. These gutters are to be covered with tile 2 inches thick and 2 feet square, and are to be ventilated at their upper ends by 6-inch riser pipes. Concrete expansion joints are provided throughout. Four-inch ground water drains to relieve pressure under the filter floor are provided. These drains are to discharge into the effluent pipe of the final settling tank.

Distribution on the sprinkling filter is accomplished by 6-inch castiron pipes laid 5 feet below the filter surface and supported on concrete posts, with 3-inch castiron risers and 59 circular spray nozzles placed about 14 feet on centers. The filter medium is to be broken stone passing a 2½-inch ring and retained by a 1-inch ring.

Final Settling Tank

The final settling tank is to be built with materials and on lines similar to those of the primary settling tank but slightly smaller in capacity and not in duplicate. Its total capacity is about 34,000 gallons, of which about 8,000 is in the upper section and 12,000 below the 6-inch slot. As in the primary tanks, lead wash-water pipes and an 8-inch sludge blow-off are provided. At the rate of 100,000 gallons per day, this provides a detention period in the upper chamber of nearly 2 hours, and about 3.4 hours for a flow at the rate of 300,000 gallons per day, and a sludge capacity of 4 gallons per capita.

Chlorination Tank

The chlorination tank is in a heated tin-roofed frame building 14 feet by 18 feet in outer dimensions. The tank itself is divided by 3 partitions into four channels giving a minimum length of flow of about 25 feet, which if desired could be increased almost 50 per cent without additional cost by placing the inlet and outlet respectively at the ends of the end channels instead of more nearly opposite their outlets or middle points. The area of the channel is about 8 square feet, its depth 2½ feet, and the contents of the entire tank about 3,000 gallons, giving a detention period for a rate of 100,000 gallons per day of about ¾ of an hour. The liquid chlorine sterilizing device is of a direct feed pattern and capable of applying chlorine at a maximum rate of not less than 1 pound per hour. Under these conditions, not less than 5 parts of chlorine per 1,000,000 parts of sewage treated should be applied to the effluent.

Sludge Beds

The sludge beds are well underdrained and appear to be of ample size. That for the primary beds is to be 34 feet 6 inches square, with an area of 1,560 square feet or .036 acre, giving an area of 1½ square feet per capita for 1,000 persons, or it will hold a dose of about 12,000 gallons per foot of depth. The sludge bed for the secondary settling tanks is 24 feet square, giving it an area of 575 square feet or .013 acre. It will have therefore an area of ½ square foot per capita for 1,000 persons, or a sludge capacity of over 4,400 gallons per foot of depth. Both beds are about 13 inches deep and similar in construction, with 1¾-inch stone around the drains and joints; above this, 8 inches of 1-inch stone followed by 3 inches of fine stone between 1/16 inch and ¼ inch in size, and the whole finished a 2-inch

surface layer of mortar sand. It would be desirable to provide riprap in front of the aprons in order to check the velocity of the sludge discharge and prevent scouring of the beds.

The sides of the sludge beds are to be riprapped to a height of 4 feet above the bottom of the underdrains. Sludge would penetrate this riprap faster than it would the upper 6 inches of filter material. It is therefore recommended that for 1 foot in elevation, both above and below the surface of the sludge beds, the riprap be either set in cement mortar or thoroughly grouted with cement grout. Much of the disposal plant is set in heavy side-hill cutting, and the new cut bank slopes, some of which are between 20 and 25 feet in length, are accordingly a danger in cases of deep frost, severe rainstorms, etc. It is, however, planned that these are to be at once heavily sodded. This, with their fairly easy slope of 1 on 1½, should enable them to be easily maintained with proper attention.

Submerged Outfall

The plan shows an outfall pipe 700 feet long. The length of the pipe, however, as scaled from the profile, is about 660. There appears, therefore, to be a slight discrepancy in the plans. The total fall in the pipe from the chlorinating building to the end of the effluent pipe in the canal. 10 feet below low water, is 15 feet, but the hydraulic slope or fall from the effluent surface in the chlorination tank to the low water surface in the canal is only 5 feet. The effluent pipe is, nevertheless, not shown to have a continuous slope between these points, but to have an abrupt drop of 3 feet at a manhole 60 feet from the chlorinating building, leaving about 2 feet of hydraulic head for the remaining 600 feet provided the canal is at its low water stage. The extent of this drop in grade elevation at the upper end of the line would appear to unduly increase the depth and the extent of costly deep water construction. Furthermore, it keeps the effluent standing in about 500 feet of pipe even when there is no flow at all, and the pipe would be under a head in from 50 to 100 feet more when the maximum flow is forcing its way out. The Department has been advised, however, at a conference with representatives of the State Architect's Department, that the length of iron pipe is to be increased and that it is expected to construct this work at a time when the canal is unwatered.

It is assumed that before the disposal plant is put in operation plans will be submitted providing a water supply therefor, either by extension from the present approved supply or other source.

As a result of our examination of these plans, and after a careful consideration of the local conditions and features of design, I recommend that these plans for the proposed sewerage system and disposal plant for the Marcy Division of the Utica State Hospital be approved.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y. *August* 3, 1920 *Chief Engineer*

MIDDLEBURG (High School)

Plans were approved on July 9, 1920, for sewage disposal for the high school in School District No. 1 of the town of Middleburg, located in the village of Middleburg, Schoharie county. The plans provided for a sewage disposal plant consisting of a settling tank, diverting chamber, and subsurface irrigation system. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Education of School District No. 1, town of Middleburg, to discharge

effluent from the proposed sewage disposal plant at the High School in said school district at Middleburg into the ground waters tributary to a small branch of Schoharie creek, within the municipality of Middleburg, Schoharie county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal plant.

2. That no sludge shall be discharged into any stream or other body of water, or deposited on the surface of the ground where it might be washed by rain or melting snow into any stream or other body of water.

3. That the subsurface irrigation system shall contain not less than 10 feet of distributing tile per person served, and that the lateral distributing tile shall be laid in trenches backfilled with not less than 6 inches of coarse cinders, broken stone, or gravel in such a manner that the lines of tile shall be covered and surrounded with such coarse material.

4. That whenever required by this Department, the subsurface irrigation system shall be extended or some other suitable method of disposal of the sewage from this school shall be provided under plans which must first be submitted to and receive the approval of this Department.

5. That no part of any distributing tile of the subsurface irrigation system shall be less than 5 feet from the top of the bank of the stream near the disposal plant.

6. That the ends of all lines of distributing tile on the sides of the subsurface irrigation system near the stream be effectively plugged.

M. NICOLL, JR.

July 9, 1920 *Deputy State Commissioner of Health*

MIDDLETOWN (State Homeopathic Hospital)

The following plans were approved during 1920 for the State Homeopathic Hospital at Middletown, Orange county:

On April 8, plans for sewer and water extensions.

On August 18, plans for sewage disposal, cottage for patients, Comfort farm.

On September 13, plans for underground sewer connections for chronic hospital.

On October 19, amended plans for sewage disposal for cottage for patients, Comfort farm.

On October 29, plans for sewer and water extensions.

NAPLES (Steuben Products Company)

Plans were approved on June 11, 1920, for the disposal of canning wastes and floor washings from the factory of the Steuben Products Company, in the village of Naples. The plans provided for the treatment of the wastes in septic tanks and by sand filtration. The sanitary sewage and ensilage drainage is to be disposed of by leaching cesspools. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 78 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Steuben

Products Company to discharge effluent from beneath the ensilage pit into the ground water and from the drains of the sand filter of the proposed disposal plant into the waters of the State tributary to Naples creek, within the village of Naples, Ontario county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That both the ensilage drain pit and the sewer and disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.

2. That additional filters shall be constructed when required under plans which must first be submitted to and receive the approval of this Department.

3. That no storm water or surface water or unpolluted cooling water shall be discharged into the settling tanks or onto the sand filters.

4. That the sludge shall be buried or otherwise disposed of without nuisance, and that no sludge shall be discharged into any stream or body of water of this State or be deposited on the surface of the ground where it might be carried thereto by rain or melting snow.

5. That the filtering material over the gravel surrounding and covering the underdrains shall consist of a layer of sand not less than 30 inches deep and having an effective size of not less than 0.2 millimeter nor more than 0.5 millimeter, and a uniformity coefficient of not greater than 5.

M. NICOLL, JR.
June 11, 1920 *Deputy State Commissioner of Health*

NEWFIELD (Town) (District School No. 2)

Plans were approved on January 31, 1920, for a sewage disposal plant to serve the public school in District No. 2 of the town of Newfield, Tompkins county. The plans provided for a sewage disposal plant consisting of a settling tank, dosing chamber, and subsurface irrigation field. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Education of School District No. 2, town of Newfield, Tompkins county, to discharge effluent from the proposed sewage disposal plant to serve the public school in District No. 2 into the ground waters of the State tributary to the west branch of Cayuga inlet, within the town of Newfield, in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.

2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.

3. That the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.

4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers.

5. That the sludge be removed from the tank when necessary in such a manner as to cause no nuisance and disposed of by burying in some remote place, and that no sludge from any part of the disposal plant be deposited in any watercourse or on or in the ground in such a manner that it may be washed by rain or melting snow into any watercourse.

6. That the drain tile be laid so that the depth from the surface of the ground to the top of the tile shall in no case be greater than 18 or less than 12 inches.

M. NICOLL, JR.
January 31, 1920 *Deputy State Commissioner of Health*

NEW WINDSOR (Town) (District School No. 1)

Plans were approved on August 30, 1920, for a proposed sewage disposal plant for the public school in School District No. 1 in the town of New Windsor, Orange county. The plans provided for the treatment and disposal of the sewage in works consisting of a settling tank and two batteries of cesspools of 5 cesspools each. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Trustees of School District No. 1, town of New Windsor, to discharge sewage effluent from the proposed system of leaching cesspools into the ground waters tributary to the Hudson river within the town of New Windsor, Orange county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers.
2. That when necessary sludge shall be removed from the proposed tank in such a manner as to cause no nuisance, and disposed of by burying in some remote place or in some other satisfactory manner.
3. That no sewage, scum or sludge from any part of the disposal works or sewer system tributary thereto shall be discharged into any watercourse or body of surface water, or deposited where it may be carried thereinto by rain or melting snow.
4. That whenever required by the State Commissioner of Health, satisfactory detailed plans for extension to the proposed plant or for other satisfactory method of disposal of the sewage of the school shall be submitted for approval; and upon approval of said plans any or all portions of such extensions or works for some other method of disposing of the sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.
August 30, 1920 *Deputy State Commissioner of Health*

NORTH HEMPSTEAD (Town) (Great Neck Sewer District)

Amended plans for relocation of a sewer on Fifth street, in the Great Neck Sewer District of the town of North Hempstead, were approved on December 10, 1920. No permit was issued since no additional sewers were to be constructed and no sewage was to be discharged in addition to that provided for by the plans originally approved.

NORTH HEMPSTEAD (Town) (Port Washington Sewer District)

Plans were approved on May 14, 1920, for sewer extensions in Carlton and Ohio avenues and Washington and High streets, in Port Washington Sewer District No. 1 of the town of North Hempstead. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 77 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Sewer Commissioners of Port Washington Sewer District No. 1 of the town of North Hempstead, Nassau county, N. Y., to discharge sewage from the proposed sewer extensions after treatment in the Port Washington sewage disposal plant into the waters of Manhasset bay, through the existing outfall from the sewage disposal plant within the town of North Hempstead, in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewer extensions.
4. That no sewage sludge or scum from any part of the disposal works shall be discharged into Manhasset bay, or into any of the waters or tributaries of Long Island sound or New York bay, or within 10 miles of any shore except that such sewage, sludge or scum may be deposited on land at such points and in such a manner as may be approved by the State Commissioner of Health.
5. That whenever required by the State Commissioner of Health, satisfactory detailed plans for an extension of the outlet pipe from the disposal works or for additional works for more complete treatment of sewage shall be submitted for approval; and after approval of said plans such extension of the effluent pipe or any or all portions of such additional or supplementary works for more complete treatment of sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.
May 14, 1920 *Deputy State Commissioner of Health*

Amended plans were approved on October 29, 1920, for changes in the sewers in High and Locust streets, in the Port Washington Sewer District No. 1, in the town of North Hempstead. No permit was issued in connection with the approval of these plans since they were simply amendments to plans already approved and since they did not provide for the discharge of sewage not contemplated by plans heretofore approved.

NUNDA (Peck & Pratt Condensed Milk Company)

Plans were approved on January 7, 1920, for sewage and waste disposal plants to serve the Peck & Pratt Condensed Milk Company's factory at

Nunda, Livingston county. According to the plans, it was proposed to treat the wash water in a settling tank and discharge the effluent from that tank into Keshequa creek, and to dispose of the domestic sewage by means of a settling tank and subsurface irrigation system. The permits issued in connection with the approval of the plans follow:

PERMITS

Application having been duly made to the State Commissioner of Health, as provided by section 78 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to Peck & Pratt Condensed Milk Co. to discharge effluent from the proposed disposal plant to treat the trade wastes from their condensery at Nunda, Livingston county, N. Y., into the waters of Keshequa creek, within the municipality of Nunda, in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That no sludge from any part of the disposal works shall be discharged into Keshequa creek or any other watercourse, or be deposited on the surface of the ground where it might be washed by rain or melting snow into Keshequa creek or any other watercourse.
4. That only wash water from the cans, tanks, and floors, and no storm water or condenser water be permitted to enter the tanks, and that no sewage be permitted to enter the tanks or the outfall sewer.

M. NICOLL, JR.

January 7, 1920 *Deputy State Commissioner of Health*

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to Peck & Pratt Condensed Milk Co. to discharge effluent from the proposed sewage disposal plant to treat the domestic sewage from their condensery at Nunda, Livingston county, N. Y., into the underground waters of the State tributary to Keshequa creek, within the municipality of Nunda, in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof, except as required by section 4 and 5 of this permit.
4. That the length of the proposed settling tank be increased so as to make its dimensions approximately 4 feet by 7 feet by 5 feet deep below the flow line.
5. That the baffle near the outlet end of the tank be extended to about 12 inches below the normal flow line of the tank.

6. That only domestic sewage and no storm water, wash water, condenser water, or other wastes be permitted to enter the plant.

7. That no sludge from the plant be deposited on or in the ground within 200 feet of any well or watercourse, or deposited in such place or manner that it might be washed by rain or melting snow into any watercourse or near any well.

M. NICOLL, JR.

January 7, 1920 *Deputy State Commissioner of Health*

OGDENSBURG

On April 21, 1920, plans were approved for a trunk sewer and sewer laterals in the city of Ogdensburg, in Barre, Jay, Knox, and Champlain streets. The permit issued in connection with the approval of the plans contained only the usual revocation and modification clauses.

On June 3, 1920, plans were approved for the proposed extension of a sewer in Green street. The permit issued in connection with the approval of the plans contained only the usual revocation, modification, storm water, and complete construction clauses.

On July 1, 1920, plans were approved for a sewer extension on South Rosseel street. The permit issued in connection with the approval of the plans contained only the usual storm water and complete construction clauses.

On September 17, 1920, and October 15, 1920, plans were approved for sewer extensions on Champlain street and Ogden street respectively. The permits issued in connection with the approval of these plans contained in addition to the storm water clause, the following condition:

That the flush pipe and cover be so arranged that it shall not be directly connected to the riser pipe, and that it be so built that breakage may not result from settlement or from surface disturbances being directly transmitted to the riser pipe or sewer line.

ORWELL (Town) (Ideal Rest Sanatorium)

Plans were approved on April 20, 1920, for a sewage disposal plant for Ideal Rest Sanatorium, in the town of Orwell, Oswego county. The plans provided for a settling tank and sewer to Orwell creek. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to Dr. P. D. Bailey to discharge effluent from the sewage disposal plant of the Ideal Rest Sanatorium into the waters of Orwell creek on his property, within the town of Orwell, Oswego county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.

2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.

3. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the sewage disposal works.

4. That no sewage sludge from any part of the disposal works shall be discharged into Orwell creek or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.

5. That when necessary the sludge shall be removed from the tank in such a manner as to cause no nuisance, and disposed of by burying in some remote place.

6. That whenever required by the State Commissioner of Health, satisfactory detailed plans for additional works for more complete treatment of the sewage of the sanatorium shall be submitted for approval; and upon the approval of said plans any or all portions of such additional or supplementary works for more complete treatment of sewage shall be constructed and put in operation at such time or times thereafter as the said Commissioner may designate.

M. NICOLL, JR.

April 20, 1920 *Deputy State Commissioner of Health*

OSSINING (Sing Sing Prison)

Amended plans for sewer extensions to serve the new clinic building, detention building, and mess hall at Sing Sing Prison were approved on February 11, 1920. On June 17, 1920, plans were approved for a relocation of the proposed sewage pumping station, and on July 3, 1920, plans were approved for a second relocation of the pumping station. Plans for the relocation of a portion of a sewer were approved on July 27, 1920. No permits were issued in connection with the approval of these plans.

OYSTER BAY (Town) (District School No. 12)

Plans for sewage disposal for the public school of District No. 12, at Syosset, in the town of Oyster Bay, were approved on August 30, 1920. The plans provided for the disposal of the sewage by two leaching cesspools designed to operate in series. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to Board of Trustees of School District No. 12, town of Oyster Bay, to discharge sewage effluent from the proposed system of leaching cesspools into the ground waters tributary to the Atlantic ocean within the town of Oyster Bay, Nassau county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal plant.

2. That the sewage disposal plant shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof, except that the inter-connecting pipes be made 5 inches in diameter and the manhole openings be made 24 inches in diameter.

3. That when necessary the sludge shall be removed from the proposed plant in such a manner as to cause no nuisance, and disposed of by burying in some remote place.

4. That whenever required by the State Commissioner of Health, additional cesspools shall be installed, or detailed plans for some other

satisfactory method of disposal of the sewage of the school shall be submitted for approval; and upon the approval of said plans any or all portions of such disposal plant for the complete treatment of sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.
Deputy State Commissioner of Health

August 30, 1920

PARIS (Town) (Clayville Knitting Company Development)

Plans for a sewer system and disposal works for a housing development of the Clayville Knitting Company, in the town of Paris, were submitted to this Department for approval on July 10, 1920. The unapproved plans were returned for revision, the report upon the examination of the plans following:

HERMANN M. BIGGS, M. D., *State Commissioner of Health:*

I beg to submit the following report on the examination of plans and application for a sewer system and disposal works for a housing development of the Clayville Knitting Company, just outside the corporation limits of the village of Clayville, in the town of Paris, Oneida county, N. Y., submitted to this Department for approval by the engineer for the company on July 10, 1920.

ENGINEER'S REPORT

The report of the engineer states that the proposed sewer and disposal works are designed to provide for a population of 250 persons in this private housing development which the Clayville Knitting Company is now engaged in building on their property. This development is planned ultimately to comprise about 50 houses. The application states that 10 of these houses are contemplated for present construction.

General Location

Clayville is located on the Delaware, Lackawanna and Western railroad about 15 miles south of Utica, on the southerly side of the watershed of the Mohawk river. The village has a population of about 1,000 persons, and is built on both sides of Saquoit creek and around the pond formed by a dam on the creek at this point. The housing development property of the Clayville Knitting Company is situated about half a mile north of the village and east of the main highway along which most of the town is constructed, and which lies between this property and the creek.

General Design

The plans submitted show a nearly rectangular tract of land for building site about 500 feet by 1,000 feet in size, located at an elevation of about 100 feet higher than the creek. The upper or westerly portion of this tract is subdivided by curved streets and plots for which sewers are to be provided. The sewage is then to be conveyed by gravity in a northwesterly direction about 1,600 feet across a cemetery, private land, and a highway, and through areas shown as owned by the Clayville Knitting Company, on the Saquoit creek. It is planned to treat the sewage at this point in duplicate two-story settling tanks, with an auxiliary sludge filter, before discharging it into the creek. This creek has an area of watershed of over 10 square miles above Clayville, and receives considerable pollution above this point of discharge and is not suitable as a source of domestic water supply.

Detailed Examination

The plans have been carefully examined with respect to the sewerage and sewage disposal works. In connection with the sewerage system the design has been carefully studied with reference to alignment, sizes, grades,

capacities, facilities for cleaning and inspection and flushing, and other features of a hydraulic or sanitary nature. In connection with means for sewage disposal, it has been studied with reference to general method and efficiency of the sewage treatment plant as a whole, and of the capacities and practical operation of the individual structures, appurtenances, and apparatus, and particular recommendation made looking toward a possible improvement of the regulation of flow through the settling tanks.

Alignment and Details

The sewers, including the outfall, are all to be of 8-inch vitrified pipes laid on slopes of 0.6 per cent or over, which should give them self-cleansing velocities and ample capacity. They are to be so located that the cuts will vary from 3 feet to 11 feet, and are to be laid largely through the rear portions of the lots apparently for the purpose of shortening the house branches. Manholes are provided at all deflections and at intervals of not over 400 feet. If the possibility were less remote of this subdivision being taken into a municipality, the location of lateral sewers off of streets might be a serious objection. In this case it is felt that the curved streets and other circumstances make permissible the alignments chosen, and for similar reasons the location of the angle manhole which is shown on the side instead of the center of the highway marked on the plans Church street extended, appears satisfactory. It is, however, desirable whenever possible to place both sewers and manholes in the centers of streets and highways.

Disposal Site

The disposal site is located about 500 feet from Church street extended. The geological survey of 1904 shows a highway along which are houses, which highway crosses the creek about one-half mile below where the effluent is planned to be discharged. The plant structure itself is located on the higher portion of a trapezoidal plot about 120 feet by 150 feet on a side. The bank of the creek at this point slopes from elevation 948 to 908, or about 40 feet in 200 feet, to a low wet area along the stream. The treatment tank is planned for construction about midway up on this bank.

Disposal System

The sewage is to enter a distribution manhole adjacent to the reinforced concrete settling tanks, into either or both of which it can be diverted. The piping and gates are shown to be so arranged as to permit the sewage flowing through the tanks either in series or in parallel, and to enter a discharge manhole at elevation 927, and to leave this manhole 18 feet lower, at elevation 909, through an 8-inch effluent pipe on a 0.75 per cent slope, which then conducts it 130 feet to a point of discharge into the stream near the east bank of the creek. Care must be taken to prevent odors from arising from the sudden drop and splash of the effluent where it falls 18 feet vertically in the discharge manhole and a downcast pipe should be inserted if a nuisance from this cause should arise.

Treatment Tanks

The duplicate settling tanks are planned to be built of reinforced concrete and are provided with 3-inch cypress covers. It is suggested that all parts of the disposal plant except the sludge filter be covered, and that where planks are used these should be thoroughly painted to prevent harboring insects and decay, and the planks should be chained together or otherwise secured against removal. These tanks are each 7 feet square by 13 feet deep. Their combined hydraulic capacity is to be 8,000 gallons, or sufficient if unsubdivided for 8 hours detention of sewage at a normal rate from 250 persons. The upper portion of each of the 2 tanks is, however, to be subdivided into 2 upper or settling compartments by a central wall 12 inches wide at the top, 6 feet deep, and running the length of each tank. These upper compartments are to have bottoms formed by 3-foot slate slabs ⅞ inches thick, laid on a slope of 4/5 on 1, and having a 6-inch slotted opening between their lower

edges and the outer walls of the main tanks. The slate slabs must be protected from breakage and frequently examined to ascertain their condition. As slight a slope as that used has been found in other cases to retard the downward movement of deposits; for this reason a slope of at least 1⅛ to 1 is recommended for these slate slabs. Also that baffles about 9 inches from the outlet extending a foot below the surface, or other means, be provided for preventing the escape of fragments of scum or large undigested particles into the stream, and similar baffles be provided to distribute the inflow as widely and as early as possible.

Capacity of Tanks

These 2 upper compartments of each tank together are to hold 1,350 gallons, while the useful sludge capacity measured from a foot below the bottom of these compartments is 1,400 gallons, and the chimney or central well section together with the unavailable section above the sludge about 1,250 gallons for each main tank. Thus both tanks combined give normally, for 250 persons, in the upper portion a settlement detention period of between 1½ hours and 2 hours and an apparently satisfactory sludge capacity of 11 gallons per capita in the lower portion.

Uniformity of Flow

It is planned for the sewage to enter the tanks from 2 long 8-inch bends extending out nearly 2 feet from the wall, thus materially lessening the length of flow through each tank. The sewage enters these bends through 2 openings in the side of flat bottomed trough 18 inches wide to which the sewage is admitted at one end. In practice it has been found that such exposed and putrefying settlements giving out foul odors rapidly form in the angles and portions of such troughs where cleansing flow is not constant; and furthermore, that the channel to the second opening soon becomes obstructed so that the sewage following the line of least resistance is all diverted into one of the compartments thus losing half the detention period and about half of the value of the tank installation. The curved end connections, although permitting the tanks to be operated in series, cannot be approved as shown, as they could be arranged to by-pass the sewage around the tanks. It is accordingly recommended that these curved end connections be omitted, and that the entrance of the sewage to the settling tanks be so arranged by a short end trough with baffle protected weir or otherwise that it will have equal distance as short as possible to flow to reach each compartment.

Sludge Treatment

The tanks as planned have hopper bottoms at about elevation 914, or 13 feet below the water surface in them. In these bottoms a 10-inch iron pipe provided with a gate valve will permit the sludge to be drawn into a manhole 4 feet square with bottom elevation 913. From here the sludge is to be led through 15 feet of sewer to sludge bed, at elevation 912.5, 1 foot above the surface of the sludge filtering material. The sludge filter is to be 25 feet in length by 5 feet in width, and is to have vertical walls rising 3 feet above its sand surface. Its area is to be 125 square feet, or ½ square foot per capita. Its capacity is to be 940 gallons per foot, or 2,800 gallons for 3 feet, which equals the combined useful sludge capacity of both main tanks together. The filter medium is to be 1 foot of coarse sand underdrained by 4 lines of 4-inch tile bedded at the bottom of a 6-inch layer of gravel.

As a result of our examination of these plans and after a careful consideration of the features of the design, I would recommend that the plans be returned for the following additions and amendments:

1. That the inlets to the settling tanks be so formed that the sewage will have an equal distance to flow to each settling compartment if two compartments are used for each tank, and so that it will begin its flow in each compartment behind distributing baffles placed near the wall of the tank through which it first passes; and further, that both protruding inlets and also the curved pipe outlet and any by-passes be omitted.

2. That the slope of the slate slabs in the bottom of the settling compartments be increased to not less than 1.2 vertical on 1.0 horizontal, and that the outlets of these tanks be protected by baffles.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *August* 7, 1920 *Chief Engineer*

Amended plans were approved on September 14, 1920, for a sewer system and disposal works for the housing development of the Clayville Knitting Company. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to Clayville Knitting Company to discharge effluent from the disposal plant to be constructed in connection with the proposed sewer system to care for the sewage from the property of said company at Clayville, into the waters of Saquoit creek, within the town of Paris, Oneida county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That only domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers and sewage disposal plant.
2. That no sewage sludge from any part of the disposal plant shall be discharged into Saquoit creek or any other body of water, or deposited on the surface of the ground where it may be washed by rain or melting snow into Saquoit creek or any other body of water.
3. That the floor of the inlet manhole be sloped toward the path of flow of the incoming sewage.
4. That a difference in elevation of the crests of the inlet and outlet weirs of at least 1 inch be provided.
5. That the projection from the wall of the settling tank designed to trap the gases resulting from the digestion of sludge be so increased in size as to provide a trap of at least 4 inches to prevent these gases from reaching the sedimentation chamber.
6. That at least one line of perforated lead pipe be provided extending around the four sides of each hopper of the settling tank, so designed as to furnish an efficient means of loosening the accumulated sludge preparatory to blowing it off.
7. That the sludge blowoff valves be located in the outlet manhole.
8. That whenever required by the State Commissioner of Health, satisfactory detailed plans for additional works for more complete treatment of the sewage of the realty development of the Clayville Knitting Company, shall be submitted for approval; and after the approval of said plans, any or all portions of such additional or supplementary works for more complete treatment of the sewage, shall be constructed and put in operation at such time or times as said Commissioner may designate.

M. NICOLL, JR.

September 14, 1920 *Acting State Commissioner of Health*

PELHAM MANOR

Plans for alterations and extensions to the sewerage system of the village of Pelham Manor were approved on February 25, 1920. The plans contemplated the construction of sewers in Iden and Reed avenues and other streets

and private ways in the northeast part of the village. The permit issued in connection with the approval of the plans contained in addition to the usual revocation, modification, complete construction and storm water clauses, the following condition:

That all sewage to be collected by the proposed sewers shall be treated in the sewage disposal works of the town of Pelham.

PORT CHESTER

Plans were approved on December 8, 1920, for a proposed sewer extension in Beech street, in the village of Port Chester, Westchester county. The permit issued in connection with the approval of the plans allows the discharge of effluent from the proposed sewers through the disposal works into the waters of Long Island sound, through the existing outfall sewer at the harbor of Port Chester, and contains, in addition to the usual complete construction and storm water clauses, the following condition:

That whenever the 40-foot extension east from the manhole on the 8-inch sewer near the easterly end of Beech street is constructed, a manhole shall be provided at the easterly end of this extension.

RENSSELAER

Plans were approved on October 16, 1920, for extensions of outfall sewers in Central avenue and Tracey street, in the city of Rensselaer. No permit was issued in connection with the approval of the plans since the proposed extensions did not provide for the discharge of any additional sewage.

ROCHESTER (State Hospital)

Plans were approved on October 29, 1920, for modifications and additions to the sewage pumping station of the Rochester State Hospital.

RYE

Plans were approved on January 28, 1920, for modifications and extensions to the sewerage system and sewage disposal plant of the village of Rye. The report upon the examination of the plans and the permit issued in connection with their approval follow:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on the examination of plans for modifications and extensions to the sewerage system and sewage disposal plant of the village of Rye, Westchester county, New York, submitted to this Department for approval by the Board of Trustees of the village on January 27, 1920.

Preliminary plans for a comprehensive sewerage system and sewage disposal plant for the village were approved by this Department in June, 1907, subject to subsequent approval of detailed plans of the system and disposal plant. These detailed plans were submitted during the following year and approved on September 15, 1908. A large part of these sewers and the disposal plant were constructed during the years 1909 and 1910 and have been in operation since then. The plans now submitted contemplate the construction of some of the lines shown on the 1908 plans but not constructed, and a few additional laterals not shown on those plans; the substitution of cast-iron for the vitrified pipe shown on the original plans through certain low wet areas; the formation of the new low level district to serve the Rye Town

Park district; the construction of a pumping station to serve this district; and the construction of a new sewage disposal plant to be located on Blind brook.

According to the map and profiles submitted, it is intended to construct about 8¾ miles of new sewers in the near future. With the exception of about ½ mile of 10-inch sewer, and a short length of the outfall sewer from the disposal plant, these lines will be 8 inches in diameter. In general they will be of vitrified tile pipe. The 10-inch line just mentioned and a section of 8-inch sewer on the same street, however, which will be in low wet ground, are to be of castiron pipe laid with leaded joints in order to prevent the possible infiltration of ground water. The proposed grades of the sewers have in many cases been made very flat in order to avoid excessive rock excavation and deep trenches in wet ground. The minimum grade used for the 8-inch lines is 0.25 per cent, a slope which will cause a low velocity and consequent sedimentation and which will make it necessary that the sewers be carefully laid and frequently inspected and flushed if stoppages are to be avoided. Manholes will be provided at intervals of from 300 to 350 feet, and flush tanks fitted with automatic siphons will be provided at the upper ends of all lateral sewers.

The small low level system near Rye Town Park comprises about a half of a mile of 8-inch sewers draining to a pumping station which will discharge the sewage through a 6-inch force main about 400 feet long into the gravity system at the corner of Forest and Dearborn avenues. The maximum flow to this pumping station will probably not exceed about 75 gallons per minute.

The pumping station is to be a circular reinforced concrete structure 12 feet in diameter. The lower part of the building, which extends 18 feet below the surface of the ground, forms a pump well and screen room and is surrounded by a one-story building housing the motors and switchboard. The pump well is divided by a partition and screen into two compartments. The sewage enters through an 8-inch inlet pipe and falls to the first compartment, from which it passes through a screen consisting of ¾-inch angles set 1½ inches apart and having a gross submerged area of about 20 square feet into the second compartment, which contains two submerged centrifugal pumps. The depth of the pump well below the high-water line is 4 feet, and the total available capacity of the well about 3,300 gallons. There is no overflow to the pump well. Each of the two pumps will have a 4-inch discharge and a capacity of 100 gallons per minute, and each will be provided with a vertical motor on the same shaft located in the motor room above the level of the ground. Floats and float switches will be provided for controlling the motors. The pumps and motors will be so arranged that either of the pumps may be readily raised for inspection and repairs without interference with the operation of the other. The power will be obtained from the Westchester Lighting Co. No auxiliary source of power is provided, it being considered that the source of power which includes four separate generator plants makes the possibility of interruption of service a very remote one.

At the present time the sewer from the section of the village known as the Rye Beach district, amounting to about 135,000 gallons per day, drains by gravity to the disposal plant located near Manursing Island; and that from what is known as the Blind Brook district, amounting to about 395,000 gallons per day, drains to a settling tank and pumping station on the east side of Blind brook and is pumped from there to the disposal plant just mentioned. There are about 11,500 feet of sewers in the first district, and about 25,600 feet in the latter district.

It is now proposed to construct a new sewage disposal plant on the west bank of Blind brook to treat the sewage from the Blind Brook district, and to continue the operation of the Rye Beach plant to treat only the sewage from the Rye Beach district and the new Rye Town Park district the sewage from which will be discharged into the Rye Beach system. The use of the existing Blind Brook pumping station will be continued as at the present, except that a new settling tank will be added, and the force main will be arranged to discharge the sewage to the new Blind Brook plant instead of to the present disposal plant.

It is estimated that in 1925 the flow from the Rye Beach district which will then have about 24,300 feet of sewers, including trunk sewers, will be about 289,000 gallons per day. Under the new arrangement the present Rye Beach plant will be used to treat this sewage. The total capacity of the existing settling or digestion tanks now in use at this plant is, according to the plans on file in this office, about 100,000 gallons, which will give an average detention period of 8 hours with the estimated flow of 289,000 gallons per day if the entire tank is used, or a shorter period if some of the compartments are cut out. The portion of the sprinkling filter which has been constructed and is now in use has an area of .027 of an acre, which will give a rate of about 1,100,000 gallons per acre per day, or a little less than 200,000 gallons per acre per foot of depth per day with the estimated sewage flow. It seems apparent, therefore, that the old plant will have ample capacity to care for the sewage which will reach it under the new plan.

According to the engineer's report, there will be 60,000 feet of sewers including trunks in the Blind Brook district after the proposed extensions are completed, and he estimates that the flow from these sewers in 1925 will be about 625,000 gallons per day. This sewage will be cared for by the present Blind Brook pumping station and the proposed new disposal plant.

In order to provide for the additional sewage that will be received from the new extensions, another compartment, built in accordance with the plans approved by this Department in 1908, will be added to the three compartments of the settling tank now in use at the Blind Brook station. This will make the total capacity of the settling tank 192,000 gallons, or the equivalent of 7.4 hours average flow based on the estimated daily flow of 625,000 gallons. The pumps will not be altered, their capacity being sufficient to care for all the sewage that will be received. The present force main will be cut and a Y and suitable valves arranged so that the sewage may be discharged to the new plant. A 16-inch castiron force main about 500 feet long will be laid between the Y and the proposed disposal plant.

The proposed new disposal plant is to consist of dosing chambers, sprinkling filters, chlorination plant, final settling tank, and sludge beds for use in connection with the final settling tanks. The effluent from the plant will be discharged into Blind brook at the village dock and below the dam near the foot of Hewlett street.

The settled sewage from the Blind Brook pumping station will be discharged into a trough connecting the two dosing chambers of the sprinkling filter and divided approximately equally between them. Each of these chambers is of concrete, paraboloidal in shape, and has an available capacity of 2,000 gallons. A 10-inch siphon is provided in each chamber for discharging its contents into the distribution systems of the sprinkling filters. The engineer estimates that each discharge of 1 siphon will amount to about 4,600 gallons, including the inflow during discharge. This inflow will be variable due to the fact that it will be received from the pumping station where one or more pumps may be in operation; and it is possible that at times the period of discharge may be materially lengthened, a condition which must be carefully considered in connection with the size of the siphons, which should be large enough to break properly if a uniform distribution is to be obtained. In this case the siphons appear to have sufficient capacity to care for the flow if the pumps are operated so as to produce a uniform discharge, but they may cause unsatisfactory distribution if the pumps are operated irregularly. Care should therefore be taken to secure uniform operation or larger siphons or an additional unit installed to care for the flow.

The sprinkling filter is to be built up of coke, of such size as will pass a 1½-inch screen and stop on a 1-inch screen. The bed is to be open on the sides, from 6 feet to 6½ feet in depth, and will have an area of about 0.37 of an acre, making the rate of filtration with the estimated flow about 1,700,000 gallons per acre per day. The bed will be divided into two approximately equal parts, each connected to one of the dosing chambers mentioned above. The distribution system consists of castiron pipe varying from 12 to 4 inches in diameter, laid near the surface of the beds, with 2½-inch risers to the nozzles. There are 47 nozzles on one section of the bed and 46 on the

other, making a total of 93. The nozzles are staggered and set 14 feet on centers. The head on the nozzles will vary from a maximum of 7.5 to a minimum of about 2.0 feet. The bottom of the bed will be covered by 8-inch half tile arranged to form a false bottom and allow the effluent to flow to the main drainage channels and thence to the chlorinating plant. The plans provide for future extensions to the filter and its appurtenances, to increase its capacity to about 1½ times its proposed present capacity.

A chlorinating plant, consisting of a float controlled liquid chlorine apparatus and mixing tank, is located immediately adjacent to the filters. Here the sprinkling filter effluent will be treated with liquid chlorine at the rate of 5 parts per million, and caused to flow through mixing troughs fitted with suitable baffles to the final settling tank. The plans call for only one chlorinating machine. These machines frequently break down, and it would seem desirable that two machines be installed to prevent possible interruption of the application of the chlorine due to the failure of one piece of apparatus.

The final settling tank is an open concrete basin divided into 2 equal parts, each 28 feet by 30 feet in plan, and having a depth of 3 feet 2 inches, making its total capacity 38,000 gallons, the equivalent of about 1½ hours average flow. The chlorinated filter effluent will enter the compartments at the corners near the chlorinating plant and leave over weirs extending the full width of the sections at the side farthest from the filters. A scum baffle set 12 inches from each weir and extending from 5 inches above to 7 inches below the surface of the liquid is provided to prevent the escape of floating particles.

The effluent from the final settling tanks passes through a 12-inch inverted siphon about 430 feet long, operating under a maximum available head of 7 feet, to the east sides of Blind brook, and thence through the outfall sewer for about 2,000 feet to the outlet at the village dock.

Two sand beds, each 50 feet by 35 feet in plan, furnishing a total area of 3,500 square feet, will be provided for drying the sludge from the final settling tanks. These beds contain 1 foot 2 inches of sand, and are provided with 3-inch underdrains 10 feet on centers for collecting the effluent. The underdrains are connected to an 8-inch tile pipe which discharges into Blind brook opposite the plant. The sludge will be conducted from the final settling tank to the sludge beds by an 8-inch pipe and discharged onto the beds over concrete aprons arranged to prevent the sludge from disturbing the sand in the beds.

In view of the results of our examination of these plans, and after careful consideration of the essential features of the design and of local and general requirements, I would recommend that the plans be approved, and a permit issued to the trustees of the village allowing the discharge of the sewage from the proposed sewers after treatment in the existing and proposed sewage disposal plants into the waters of Long Island sound and Blind brook, in the village of Rye, at the points indicated on the plans.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *January* 28, 1920 *Chief Engineer*

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 77 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Trustees of the village of Rye to discharge the sewage from the proposed sewers after treatment in the proposed and existing sewage disposal plants into the waters of Blind brook and Long Island sound at the points indicated on the plans, within the municipality of Rye in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.

2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.

3. That both the sewer system and the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.

4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers.

5. That no sewage sludge from any part of the disposal works shall be discharged into Long Island sound, Blind brook, or any other watercourse.

M. NICOLL, JR.
January 28, 1920 *Deputy State Commissioner of Health*

Plans were approved on July 14, 1920, for modifications and extensions to the sewerage system and disposal works in the Beaver Swamp District of the village of Rye. The permit issued in connection with the approval of these plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 77 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Trustees of the village of Rye to discharge effluent from the proposed disposal plant to be constructed in connection with the proposed sewer system in the Beaver Swamp district of said village, into the waters of Beaver Swamp brook at a point about 400 feet from the westerly village line, within the village of Rye, Westchester county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That only sanitary sewage and no storm water or surface water from streets, roofs or other areas shall be admitted to the proposed sewers and sewage disposal works.

2. That sludge and scum shall not be permitted to accumulate in any settling tank to such an extent as to occupy more than one-fifth of normal liquid capacity of such tank.

3. That the sludge and scum from the primary settling tanks shall be removed, transported, and disposed of at some suitable point without the creation of a nuisance, or that such sludge and scum shall be disposed of on suitable sludge drying beds, plans for which shall first have been submitted to and received the approval of this Department before such beds are installed and put in operation.

4. That no sludge, scum, or screenings shall be discharged into any stream or body of water, or so placed as to be carried or washed thereinto by rain or melting snow.

5. That the sludge drip drain from the settling tanks near Davenport street shall be connected with and discharged into the first settling tank.

6. That suitable motors shall be provided to discharge, at normal rate without overloading, 210 gallons per minute to the dosing tank at the sprinklers.

7. That whenever the sewage tributary to the portions of the proposed sewage disposal plant designed to be installed first, shall exceed that contributed by 1,500 persons, additional units shall be added as provided for by the plans approved this day.

M. NICOLL, JR.
July 14, 1920 *Deputy State Commissioner of Health*

SARANAC LAKE

The following approval of a certification of the recommendation for the construction of a sewer in Winona avenue, in the village of Saranac Lake, was issued on July 9, 1920:

In the matter of the certification of the Board of Health of the village of Saranac Lake and town of Harrietstown (consolidated health district), recommending the construction of a certain sewer.

Whereas, The Board of Health of the village of Saranac Lake and the town of Harrietstown (consolidated health district), acting under the provisions of section 21-a of the Public Health Law, have deemed the sewers of the village of Saranac Lake insufficient properly and safely to sewer said village, and have certified this fact to me in writing, with its reasons therefore; stating and recommending what additions should in the judgment of such Board of Health be made, namely, the construction of a sewer in Winona avenue to discharge into the existing sewer at the foot of Winona avenue; and

Whereas, Such recommendations and the reasons therefor for the construction of said sewer and appurtenances have been carefully considered and meet with my approval;

Now, therefore, I, M. Nicoll, Jr., Deputy State Commissioner of Health, acting under the authority vested in me by section 21-a of the Public Health Law, as amended by chapter 559 of the Laws of 1913, do hereby approve said recommendations on this 9th day of July, 1920.

M. NICOLL, JR.

Albany, N. Y. *Deputy State Commissioner of Health*

SCOTIA

Plans were approved on March 3, 1920, for proposed sewer extensions in Exchange, Hetherington, and Veeder streets, in the village of Scotia. The permit issued in connection with the approval of the plans contained only the usual revocation, modification, complete construction, and storm water clauses.

SHANDAKEN (Town) (Chichester)

Plans for the proposed sewerage system and disposal plant at the unincorporated village of Chichester, in the town of Shandaken, Ulster county, were submitted to this Department for approval on July 22, 1920, by the Commissioner of Water Supply, Gas and Electricity of the city of New York. The report upon the examination of the plans follows:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on an examination of plans for the proposed sewerage system and disposal plant at the unincorporated village of Chichester, in the town of Shandaken, Ulster county, N. Y., submitted with a report and application for approval of these plans by the Commissioner of Water Supply, Gas and Electricity of the city of New York on July 22, 1920.

Department Records

The records of the Health Department of the State of New York show that on January 30, 1920, the chief engineer of the New York City Department of Water Supply, Gas and Electricity was advised that the plans for this work must be submitted to the State Department of Health for approval, in accordance with article V of the Public Health Law, and that on June 1, 1920, two engineers from the city department conferred with the Chief Engineer of the Health Department on preliminary plans for the disposal of the sewage of Chichester by sedimentation and subsurface irrigation; and further, that a conference was held on the grounds where the proposed works are planned to be installed, by an engineer from the Health Department and the city department on August 7, 1920.

Earlier Records

The Health Department records also show that previous to this time sewage disposal provisions were maintained by the city of New York at the factory of W. O. Schwarzwaelder, at Chichester, which were inspected by a representative of the State Health Department in the spring of 1917. They further show that the advice of the Deputy Commissioner of Health on sanitary provisions for the vicinity in question, sought by the Deputy Commissioner of Water Supply, Gas and Electricity, was given by letter on December 8, 1919.

General Location

The manufacturing hamlet of Chichester is situated at the confluence of Ox Clove stream and Warnerkill, about 2 miles above where the latter, which is called Stony Clove on the plans and United States geologic sheets, empties into the Esopus creek. The hamlet is located in the upper mountainous part of Ulster county, about 1 mile south of the Greene county line, on the Stony Clove and Kaaterskill branch of the Ulster and Delaware railroad, 25 miles by rail northwesterly from the city of Kingston on the Hudson. The population of Chichester itself, prior to the last census, is given as 218 persons. The population contained in town and county both appears to have remained about stationary since 1875.

Engineer's Report, Historical

The report of the engineer of the city department states as follows: "The unincorporated village of Chichester lies within the watershed of Esopus creek, from which watershed New York city obtains more than half its present supply. The village is really built around and owes its existence to a furniture factory owned and operated by William Schwarzwaelder and Company, Inc. The owners and managers of this industry live in houses located more or less at random on the company's property, while some of the operatives live in company owned houses located generally along the public highway. Two streams, the Warnerkill or Stony Clove, and the Ox Clove, unite just below the village.

Engineer's Report, Sanitation

"Of about forty buildings in the village, eight houses, one store, one office, and one stable are provided with running water and inside toilet fixtures which discharge sewage and household wastes directly into the streams mentioned above. Chemical closets installed in the factory in 1918 by the Board of Water Supply, city of New York, and now maintained by the Department of Water Supply, Gas and Electricity, provide toilet facilities for the factory operatives. The buildings not provided with inside fixtures depend on pit privies for fecal wastes. The water supply for the village comes from a small reservoir located on the Ox Clove north of the village. A system of hydrants provide fire protection. The water supply is abundant except during periods of drought or extreme cold weather. Test pits excavated at several points in the disposal field indicated a gravelly formation admirably suited for the absorption of the effluent from the dosing tank. The disposal field will be operated by the Department of Water Supply, city of New York, an employee visiting the plant at regular intervals to note general conditions and to operate the mechanical devices controlling delivery of sewage to the different sections of tile field."

General Purpose of Design

The following outline is included in the general description given by the report of the engineer for the city department: The purpose of the proposed construction is to collect all waterborne sewage and household wastes in a small sewerage system of the separate type, and dispose of same by subsurface irrigation through a tile field located on suitable ground below the village. Until such time as water supply, inside fixtures, etc., are installed in the factory, that building must continue to use the chemical closets. The system as laid out can be readily extended for connecting with buildings not

at present equipped for delivering waterborne sewage. Briefly, the design calls for a simple collecting system which will deliver the sewage to a concrete sedimentation tank, this structure to be divided into two parts, one to act as a settling basin, the other as a dosing tank. The contents of the dosing tank will be discharged through an automatic syphon into a system of 6-inch subsurface tiles arranged in sections for use in rotation.

Basis of Design

This gives design assumptions as follows:

Source of Daily Contribution	*Gallons*
10 tributary buildings, mostly residences, at 300 gallons	3,000
1 factory and office, toilets only, 100 persons, at 20 gallons	2,000
20 future fixtures, where system is in use	1,000
Total daily rate, about 800 cubic feet, or	6,000
Persons provided for in foregoing	150
Capacity settlement tank, about 2½ hrs. total flow, cu. ft	80
Digestion tank, below slot, about 2 cu. ft. per capita, cu. ft	290
Dosing tank, about 8 hrs. flow, capacity, cu. ft	200
Subsurface tile, 20 ft. each for 150 persons, 3 units	3,000
Estimated cost of work planned and specified	$16,000

General Field Inspection

In inspection on the field by one of our engineers showed that the raceway from the mill to below the private road, a distance of about 500 feet, instead of being open was used as a covered general sewer at the discharge end of which evidence of such use was most apparent. The city maintains a chlorinating station on the Esopus just below the hamlet of Phoenicia, which with a population of 350 lies 2 miles south of Chichester at the confluence of Stony Clove stream with the Esopus. About 6 miles farther down the Ashokan reservoir provides a storage detention of about 6 months, while as a further precaution the water entering the aqueduct to the city is subjected to constant bacteriological and chemical examination.

Scope of Plans

The plans now submitted show the building sites to be located along Stony Clove and Ox Clove streams in such form as to be within an equilateral triangle with legs 1,600 feet long north of a base line lying east and west along Stony Clove for a distance of about 2,100 feet. The disposal works are in the westmost angle of this triangle at an elevation of 940 feet, while the surface elevation in the other angles is about 1,100 feet. About 64 buildings are indicated on the general plan. Of these, immediate connection appears feasible for 27 houses, and for about 11 future connections seem provided. Eleven houses or buildings seem left without indicated provision, but at sufficient elevations to connect, and another 11 seem to be very small but in positions which enable connections from them to be made to the general system. Only four houses shown on the plans appear to be too low for future gravity connection to be easily made although three of these four can be reached by a 600 foot extension.

Detailed Examination

The plans and the site of the works in the field have been carefully examined with respect to the sewerage systems and sewage disposal works. In connection with the sewerage system, the design has been carefully studied with reference to alignment, sizes, grades, capacities, facilities for cleaning and inspection and flushing, and other features of a hydraulic or sanitary nature. In connection with means for sewage disposal, it has been studied with reference to general location, method and efficiency of the sewage disposal plant as a whole, and of the capacities and practical operation of the individual structures, appurtenances, and apparatus.

Sewer Location

The alignment of the sewer is so chosen as to escape deep cutting. Of the entire system only about 200 feet is more than 10 feet beneath the surface. Although the narrow but important highway from Kingston, Ashokan, and Phoenicia to Zanesville, Hunter, and Tannersville passes through the center of the hamlet, and a private road is shown running from it along Ox Clove to most of the houses not on this highway; and although as a general public policy with a view to ultimate ownership it is usually desirable to locate sewers in streets or roads, this sewer system appears to be largely located through private land. This location seems probably permissible, however, in this case, on account of the narrowness and constant use of the road and other local conditions. It seems to be explained by the statement in the engineer's report concerning the managers and operatives living on properties now owned collectively by the present factory owners. The sanitary rights and rights of way of the city are also reported to be more definitely and completely covered in a permanent right of way and maintenance agreement with the land owners.

Sewer System

The main sewer is of 8-inch vitrified pipe and extends down Stony Clove 1,850 feet from the factory to the treatment tank, from which tank the effluent is carried about 175 feet farther to a subsurface irrigation field. A 6-inch branch running northward 740 feet near the confluence of Stony and Ox Clove provides for the buildings near the north angle of the triangle near the building site. From near the factory, two 6-inch future extensions are shown — one extending northerly 380 feet to provide for a garage and two other buildings, the other extending easterly 620 feet to provide for 8 buildings at the eastern extremity of the triangle. The vitrified pipe shown passing over the tailrace under the factory building should be changed to an iron pipe.

Sewer Grades and Appurtenances

The lightest slope in the main 8-inch sewer is 0.5 per cent, which should be sufficient to produce a self-cleansing velocity. The little likelihood of any very great extensions in the near future, together with the excellent slopes attainable and short lengths, makes the small size of the 6-inch branch and extension appear permissible. The 5-inch house connections afford additional opportunities for flushing beside that arranged for in a permanent agreement with the factory proprietors, and that provided by manholes which are shown at all terminals and deflections in the sewer and are nowhere more than 400 feet apart. The castiron pipe under the two creek crossings and the vitrified pipe bends in drop manholes are shown bedded in concrete.

Location of Disposal Plant

The site for the disposal works is chosen in what appears from the United States topographic map to be relatively flat bottom land below the hamlet and between Stony Clove stream and the adjoining highway and the railroad, which seem to parallel the former at a distance of about 500 feet from it. The railroad and contours of the disposal field are not shown on the plans submitted. These plans, however, show the treatment tank to be located about 110 feet from a church. The subsurface tile field is to be within 75 feet of a house located where a branch road from the direction of the railroad enters the main road, so that it is important that the plant shall be so constructed, maintained, and operated as to prevent the creation of objectionable odors, and unusual attention and provisions to facilitate examination and cleaning are desirable. That portion of the disposal field which is to be at once underfed by subsurface irrigation pipes, is to be 15 feet from the main highway and about 30 feet from the bank of a stream. That distance is less than such rules as rule 10 of the regulations for the protection of the city's water supply might be interpreted to allow; but as the distance to the usual flow line of the stream is about 100 feet it seems permissible.

Inspection of Disposal Location

The main highway runs along the north side of this flat on a bank about 10 feet or 15 feet above the adjoining creek, while on the other side of the disposal site the ground rises on a slope of about 15 per cent to the railroad, with however a small ditch between which diverts most of the hill water from the flat. The church is at the easterly and most used end of the flat, while on the westerly end is the house previously mentioned as the only one not provided for by gravity. On the side road near this house are one or two more houses, and several others are on the main road below the disposal site. The only water supply for these houses is from outside community hydrants, and separate disposal plants may be provided when necessary.

Field Inspection of Disposal Site

The field examination of the disposal site showed it to be located on a flat or area of bottom land about 500 feet long by 200 feet wide, which is in frequent use as a ball field by the people of the hamlet. The probable use of the tank covers and surrounding ground for a standing place for smokers and others watching ball games makes the installation of proper ventilation for the settling tank, and a fence around the covers or their further strengthening, essential. It is stated in the report that test pits indicated a gravelly formation, but no water levels or grain sizes were given and no samples of soil furnished. Test pits on the location of the lower unit of subsurface tile showed 14 inches of loam followed by gravel and boulders growing more sandy as the depth increased to about 4 feet. Previous tests in April were reported as showing water at a depth of about 5 feet below the surface in a pit near the west end of the field.

Disposal Tank Details

The treatment tank is to be of the two-story type. It is to be built of concrete and will consist of an outer tank 7 feet long by 8 feet wide with vertical walls 18 inches thick extending 9 feet below water line, at which depth they terminate in a hopper bottom 2 feet deep and from 10½ inches to 12 inches thick. In the upper portion of the tank is to be placed an inner compartment or sedimentation trough 3 feet 8 inches wide at the top, which extends the length of the tank. The walls of the trough are of 4-inch reinforced concrete extending vertically 1 foot 6 inches below water line, after which they converge to a 4-inch bottom slot at a farther depth of about 2 feet 8 inches. It is customary and a satisfactory practice for this slot to be made 6 inches wide, and it is recommended that this change in width be made, as trouble, such as the bridging of gelatinous matter and large solids, has been frequently experienced with smaller openings.

Tank Capacity

The settling trough has a capacity of 623 gallons, or 0.55 cubic feet per capita for 150 persons; or if a rate of 40 gallons per capita per day be considered, a detention period of 2½ hours at this average rate of flow. The available sludge capacity of the main tank taken under a plane 1 foot below the slot is 252 cubic feet, or 1,890 gallons, giving an apparently satisfactory storage capacity of 1.7 cubic feet or 12.6 gallons per capita. It is usual to assume water consumption at 100 gallons per capita, instead of 40 gallons used by the engineer for the city department. Small hamlets are occasionally found where a water consumption as low as 40 or 50 obtains, but as this generally rapidly increases after facilities for getting rid of sewage are furnished, a larger assumption than 40 gallons is usual. However, on account of the responsible care and feasibility of duplicating this tank if necessary, its present dimensions appear satisfactory.

Facilities for Inspection and Cleaning

On the same sheet which covers the disposal works and details drawn on a scale 1/10 that marked thereon, the treatment tank is shown, covered by 5 concrete slabs reinforced by twisted bars ½-inch square on 6-inch centers,

shown longitudinally placed about 1 inch from both the top and bottom and shown transversely close to the center. These slabs are each about 8 feet long by 2 feet 2 inches wide and 6 inches thick, and are each furnished with 2 steel handles. As these slabs were stated to be provided in expectation of their use for standing upon by an assemblage of people, for which purpose, particularly considering possible injury in handling, the factor of safety used seems none too great; and as slabs of the width shown would each weigh 1,200 to 1,500 pounds, it is suggested that means for easily and carefully handling them be furnished and maintained closely at hand, and that they be carefully made and kept in condition to sustain exposure, handling, and the load of crowds of persons in motion; or that means be provided in some part for each tank or manhole to simplify examination, adjustment, and maintenance, and that this object be held in view in the design of the gate and cover, not shown, for the tile field control gate chamber or distribution manhole, which is specified as to be furnished by the city.

Flow Through Settling Tank

The outfall sewer is shown to enter the settling trough with its invert grade level with the top of the sewage in the trough. The outlet from the settling trough into the dosing chamber is protected with a vertical screen extending 18 inches below the surface about a foot from the wall, but the outfall sewer ends flush with the end wall of the tank and is neither turned down into an iron T nor submerged discharge, nor provided with a scum board or baffle slightly offset from the end to prevent any sewage discharge on top of the scum and to give it a wide distribution. It is therefore recommended that the latter of these provisions be made, to ensure better circulation of the sewage.

Dosing Chamber

The dosing chamber, which the sewage enters over a 24-inch weir, is 7 feet wide by 11 feet long in plan and has a hydraulic depth of 2 feet 11 inches. It is of concrete, with 12-inch walls and a level 8-inch bottom. The end wall thickness below the water line is reduced to 8 inches for a width of 2 feet. Above this reduced panel is shown a rectangular opening about 14 inches high which will provide a means for the effluent automatically to reach the subsurface irrigation field in case the 6-inch siphon, with which the chamber is shown equipped, fails to work.

Dosing Capacity

The siphon bell is placed about 4 inches above the floor at one end, and its air inlet pipe about 6 inches above the floor. The hydraulic content of the dosing chamber above this inlet is about 187 cubic feet or 1,400 gallons, which seems satisfactory in view of the capacity of each of the 3 units of 1,000 feet each of 6-inch open joint tile into which the subsurface system is divided. These tile units, when clean, have a liquid capacity of over 1,470 gallons. It is suggested, however, that the bottom of the dosing chamber be sloped to facilitate cleaning, as otherwise an average excess of over six inches of more or less odorous sludge will collect and remain in the bottom. It is further suggested that the siphon be placed in a sump about 5 or 6 inches in depth so as to drain more completely the chamber.

Automatic Siphon

The 6-inch sewage effluent siphon shown is shown by the manufacturer's catalogue to have an average discharge rate of 1.06 second foot through its operation when emptying a 40-gallon flush tank with an incipient head of 3 feet 8 inches. The maximum hydraulic gradient shown from the effluent surface to the pipe invert is 3 feet 6 inches, which appears to give an incipient discharge rate of about 3 second feet, or a discharge rate of nearly 2 second feet when the 8-inch outlet pipe to the distribution lines is flowing full to its maximum capacity. Since the capacity of the 8-inch effluent pipe on its ½ per cent grade shown is about 4/5 of a second foot, the discharge of the siphon will be somewhat retarded, but as care is taken to maintain

sufficient net head to operate the siphon this retardation of discharge and operation of the effluent pipe under a slight pressure appears permissible.

Effluent Outfall

The outlet manhole into which the effluent siphon discharges is 2 feet by 3 feet in plan and is of concrete, with 9-inch walls attached to the end of the dosing chamber and drained by the 8-inch effluent pipe previously mentioned. This effluent pipe is shown to have its invert at elevation 939 at this manhole, which with its scaled length of 175 feet and grade of ½ per cent would give its invert an elevation of 938.12 at the gate chamber or control manhole. The upper portion of the subsurface tile lines, therefore, appears to have an invert elevation slightly lower than 938, while the adjacent stream bed is indicated to have an elevation of about 925, further indicating that care must be taken to prevent seepage through the bank of the stream and uneven distribution by too great a rush to the ends of the subsurface tile. It is therefore suggested that their slopes, which are not specified, be made not greater than 5 or 6 inches in 100 feet.

Subsurface Irrigation

The information regarding the subsoil irrigation field is far from being as full as might be desired, there being no spacing of lines and distributing tile shown, nor are sections of distributors nor details of gates and branch lines shown. The whole system is shown in plan only, and on a space less than 3 inches square without any indication of the slopes of the field or the slopes on which the 6-inch subsurface tile and 8-inch feeders are to be laid, unless the slopes stated by the report as adopted for these sizes of pipe be taken which slopes would be about twice too much if applied to subsurface irrigation piping. It is therefore recommended that such essential details be shown. It cannot be assured in advance that in soil containing the percentage of loam present in that of the disposal field, 20 feet of tile per capita will suffice even if the exceptionally small use of water continues. For this reason it is suggested that advantage be taken at this time, when a contractor is to be present with labor equipment, to lay advantageously additional tile, even though it be found later that they are not needed at once, but may be held in reserve for subsequent use when the population sewered is increased or the soil around the present tile become saturated and clogged.

Sludge Piping

No wash water supply is shown, and the sludge pipe of the settling tank is shown only in profile. It is of 6-inch B. & S. C. I., which size, instead of the usual size of 8-inches or larger, seems permissible on account of the small size of the unit and the care and attention likely to obtain. The sludge pipe is without support for its lower section other than such temporary strength as the builder may give through the calking of the bell of its lower joint, and at the joints of the Y branch to which the lower joint hangs. The sludge is shown as let into the sludge manhole at the bottom of the latter by a shear gate in the sludge pipe. Such a gate as ordinarily installed and operated would not suffice to retard the infiltration of sewage from the tank, and the creation of a nuisance at this point might result. It is therefore recommended that the sludge pipe be firmly supported, and that a gate valve be used at its outlet, and that consideration be given to making some convenient provision for a connection from a hydrant.

Sludge Disposal

The sludge manhole is constructed of concrete, with 9-inch walls and 6-inch bottom, and has a monolithic inset reinforced slab cover weighing nearly a ton. The maximum hydraulic capacity of the sludge manhole is 60 cubic feet, but under normal operation — as it will continually decrease, lowering the level of the main tank about 0.95 feet, even in its first filling — its useful maximum capacity appears to be about 48¾ cubic feet, or less than ⅕ of the sludge capacity of the main tank. No outlet is shown from the

sludge manhole, or is any apparatus for or method of removal, treatment or disposal of sludge described. It appears from the elevation that several hundred feet of pipe would be required to convey the sludge to a sludge filter. It seems essential to an understanding of the project to have some statement or plan covering the removal, conveyance, and disposal of the sludge before finally considering the plans.

Recommendations

It is therefore recommended that the plans be returned for amplification and modifications along the lines suggested, including the following:

1. That the reason for not locating the sewers on roads, and that the methods of operation and sludge disposal be fully stated.
2. That the spacing of the tile subsurface pipes, details of the connections of the branches to the main distributors and manner of covering their joints as well as their slopes be shown, so that these important features of the design may be understood.
3. That to lessen the danger of clogging the slot in the bottom of the sedimentation trough be made 6 inches in width; and further, that either a baffle be placed near the inlet to the settling trough or other means provided for securing better distribution of flow.
4. That a strong bracket of wroughtiron heavily coated with tar, or other satisfactory method of supporting the bottom of the sludge pipe, be shown; and that a gate valve be placed at its discharge end to lessen any danger of seepage of sewage into the sludge manhole.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *August* 13, 1920

The revised plans were submitted for approval on September 3, 1920. An examination of the plans showed that they were revised in general accordance with the recommendations of the above report. The plans were approved on September 22, 1920. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Department of Water Supply, Gas and Electricity of the city of New York to discharge effluent from the proposed sewage disposal plant to be constructed by said Department at Chichester, into the ground waters tributary to the Stony Clove branch of Esopus creek, within the town of Shandaken, Ulster county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That the sewer system and the sewage disposal works shown by the plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof except that the slopes of subsurface laterals shall not exceed one-half of 1 per cent.
2. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewer system and sewage disposal works.
3. That no sewage sludge from any part of the disposal works shall be discharged into the Stony Clove branch of Esopus creek or any other watercourse or body of surface water, or be deposited on the ground where it may be washed by rain or melting snow into any watercourse or body of surface water.
4. That when necessary the sludge shall be removed from the proposed tank and disposed of by burying in such a manner as not to create a nuisance.

5. That whenever required by the State Commissioner of Health, the proposed sewage disposal plant shall be enlarged or extended or that some other satisfactory method of disposal of the sewage from this community be provided under and in accordance with plans which must first be submitted to and receive the approval of this Department.

M. NICOLL, JR.
September 22, 1920 *Acting State Commissioner of Health*

STONY POINT (Town) (Tompkins Cove High School)

Plans were approved on August 18, 1920, for a proposed sewage disposal plant for the Tompkins Cove High School, in the town of Stony Point, Rockland county. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to Board of Education of School District No. 5, town of Stony Point to discharge the effluent from the proposed sewage disposal plant to serve the Tompkins Cove High School in said school district into the ground waters tributary to the Hudson river, within the town of Stony Point, Rockland county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That the seepage trench be terminated at no less distance than 6 feet from the adjoining property.
2. That the treatment tank and trench be so placed as not to contaminate any well or source of water supply.
3. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal works.
4. That no sewage sludge from any part of the disposal works shall be discharged into the blind ditch or into any watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.
5. That whenever required by the State Commissioner of Health, satisfactory detailed plans for extension to the disposal plant or additional works for more complete treatment of the sewage of the disposal plant of the school shall be submitted for approval; and upon the approval of said plans any or all portions of such additional or supplementary works for more complete treatment of sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.
August 18, 1920 *Deputy State Commissioner of Health*

SYRACUSE

Plans were approved on September 2, 1920, for the extension from Spencer street to Hiawatha street of the existing main intercepting sewer of the city of Syracuse. The report upon the examination of the plans, together with the permit issued in connection with the approval of the plans, follow:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on our examination of plans for the extension from Spencer street to Hiawatha street of the existing main inter-

cepting sewer of the city of Syracuse, Onondaga county, submitted to this Department for approval by the Syracuse Intercepting Sewer Board on August 27, 1920.

General

Syracuse is located in the central part of Onondaga county at the southeasterly end of Onondaga lake. All but a relatively small area of about 600 acres in the southeastern section of the city drains into Onondaga lake through Onondaga creek, Harbor brook, and Ley creek. Most of the city, however, drains into Onondaga creek which flows in a northerly direction through the central part of the city. The old Erie canal extends through the city from west to east, and one of the terminals or harbors of the State Barge canal is situated on Onondaga creek in the north central part of the city.

The city of Syracuse has an area of about 11.500 acres and a population of about 172,000, giving an average density of population from the entire area of approximately 15 persons per acre. The actual density of population, however, varies from 2 to 70 persons per acre. The population tributary to the public sewer system and intercepting sewers is estimated at 158,000. The remainder of the population is not reached by the existing sewers and is provided with privies and cesspools.

The water supply of the city is derived from Skaneateles lake and is delivered to the city by gravity. The water is sterilized with liquid chlorine at certain seasons of the year. The present water consumption is approximately 26,000,000 gallons per day, and it is estimated that about 160,000 persons are supplied with the public water supply.

According to data submitted by the Intercepting Sewer Board, the present average dry weather flow of sewage tributary to the intercepting sewers is 22.62 million gallons per day, equal to a per capita rate of sewage contribution of 143 gallons per day. The present average flow of sewage, which includes storm water, is estimated at 30.37 million gallons per day, equal to a daily per capita rate of sewage contribution of 191 gallons. The population that will be tributary to the intercepting sewers of the city in 1940 is estimated at 220,000 gallons, and the average dry weather flow of sewage in 1940 is estimated at 27.52 million gallons per day, equal to a per capita rate of sewage flow of 125 gallons per day. The average rate of sewage flow in 1940 is estimated at 35.27 million gallons per day, equal to a rate of sewage flow of 160 gallons per capita per day.

With the exception of a small section in the northeastern part of the city having an area of about 600 acres, practically the entire city is sewered on the combined plan. Most of the sewers of the city have been constructed in general accordance with plans prepared by Samuel M. Gray of Providence, in 1895. The socalled Gray plans were adopted as the official map of the city of Syracuse under chapter 542 of the Laws of 1907. Certain modifications have been made in these plans by the Intercepting Sewer Board established by chapter 356 of the Laws of 1907. In this connection it may be noted that except for plans for sanitary sewers in the socalled Huntley tract, and for certain sanitary sewers in the 17th ward of the city, approved by this Department in 1915, plans for none of the sewers constructed in the city have been submitted to and received the approval of this Department before their construction.

The socalled Gray plans provided for the construction of combined sewers in all but the socalled Huntley tract in the northeastern section of the city tributary to Ley creek, and for the ultimate interception and concentration of the sewage tributary to these sewers at Hiawatha street. That objectionable conditions would be created by the discharge of sewage from these sewers into Onondaga creek and Harbor brook, and ultimately into Onondaga lake, and the need for the interception and the treatment of the sewage of the city, were recognized by Mr. Gray. In fact, he pointed out that even in 1894 the dilution afforded by Onondaga creek and Harbor brook was inadequate to prevent the creation of a nuisance in these streams, and accordingly designed plans for the interception of the sewage tributary to these

streams and for the discharge of the sewage intercepted into Onondaga creek to Hiawatha street, near the lake.

The lateral sewers of the city which have been constructed in general accordance with the Gray plans, were designed to care for all of the sanitary or domestic sewage of the city tributary to Onondaga lake, and for rainfalls of from ½ to ¾ inches per hour. They were planned to discharge into Onondaga creek and Harbor brook at the foot of nearly every street leading to these streams. The plans prepared by Mr. Gray for intercepting sewers along Onondaga creek and Harbor brook have been modified somewhat by the Intercepting Sewer Board. These sewers as finally constructed were planned to care for a maximum flow of sewage from an ultimate future population of about 400,000, which it is expected will be reached in about 70 years, and in addition an amount of storm water equivalent to this flow of sewage being estimated at 187.5 gallons per day. In estimating the dry weather flow it was assumed that the ultimate average flow of domestic sewage will be 125 gallons per day, and that the maximum rate of flow will be 50 per cent greater than the average flow. The intercepting sewers have therefore a combined capacity of approximately 150,000,000 gallons per day, equal to about six times the present dry weather flow of sewage.

The sewage collected by the sewers of the city formerly discharged into Onondaga creek and Harbor brook through numerous outlets. In order to relieve the insanitary conditions created by the discharge of sewage into these streams, the Syracuse Intercepting Sewer Board improved and in certain sections lowered the channel of Onondaga creek and constructed the present intercepting system of sewers. These sewers now discharge into Onondaga creek near Spencer street and near Hiawatha street. These intercepting sewers provide for the interception of all of the dry weather flow from the lateral sewers and for the storm water up to the capacity of the intercepting sewers. The excess flow of sewage is discharged through regulated overflows at the points where the lateral sewers are intercepted by the intercepting sewers.

Thus it will be seen that the intercepting sewers are expected to care for an amount of storm water equal to about five times the present dry weather flow, but that ultimately, when the population reaches 400,000, they will care for only twice the maximum dry weather flow of sewage. Although it is not stated how frequently the lateral sewers will overflow into Onondaga creek and Harbor brook as a result of the limited capacity of the intercepting sewers, it is obvious, with a combined capacity of the two intercepting sewers of only 150,000,000 gallons per day, which is equivalent to about .025 inch of rainfall per hour over the area served by these sewers, that overflowing of combined sewage will occur frequently at the present time, and increasingly more so in the future as the ultimate population is reached.

The main intercepting sewer varies in size from 24- to 90-inches in diameter, and at present discharges into Onondaga creek near Spencer street above the Barge canal harbor. The socalled Harbor brook intercepting sewer varies in size from 18 to 54-inches in diameter, and discharges into Onondaga creek at Hiawatha street below the Barge canal harbor. The discharge of sewage and the deposits of sludge into Barge canal harbor has created a serious nuisance. In order to remedy this condition, the city is now planning to extend the intercepting sewer to the point below the harbor and finally to treat this sewage collected by the intercepting sewers in a sewage disposal plant to be located north of Hiawatha street, and to discharge the effluent into Onondaga lake through multiple outlets about 1,300 feet from the shore.

Plans now submitted provide for the extension of the existing main intercepting sewer from its point of discharge into Onondaga creek at Spencer street to the proposed disposal plant at Hiawatha street, about 5,000 feet from Spencer street, and for the interception of the existing Harbor brook existing sewer at Hiawatha street. General tentative plans for the disposal of the sewage have also been submitted, but these plans have not been worked out in detail, and since it is the desire that earliest possible action be taken by the Department upon the intercepting sewer extension from Spencer street to the

disposal plant in order that the construction thereof may be undertaken at once, the question of approval of the sewage disposal plans will not be considered at this time.

The problem of the interception and disposal of the sewage of the city has been subject to detailed studies and experiment by Mr. Glenn B. Holmes, chief engineer for the Intercepting Sewer Board for the past 12 years, and early this year Metcalf & Eddy, consulting engineers of Boston, were engaged to pass upon the plans and report prepared by Mr. Holmes. After a detailed study of the entire problem by these engineers covering a period of some 4 months, a report setting forth the findings and results of these studies was transmitted to the city. This report, a copy of which has been transmitted to this Department, endorses in general the conclusions and recommendations and report of Mr. Holmes.

As noted above, the detailed plans now under consideration provide for the extension of the existing main intercepting sewer from the temporary outlet chamber near Spencer street to the proposed disposal plant site north of Hiawatha street, a distance of 4,863 feet, and for the interception of the Harbor brook interceptor at Hiawatha street. The proposed extension to the main interceptor is to be 90-inches in diameter, and is to be laid on a slope of 0.06 per cent from the present temporary outlet to Hiawatha street. This section of the sewer will have a capacity when flowing full of approximately 130,000,000 gallons. Below Hiawatha street, the point of interception of the Harbor brook interceptor, the main intercepting sewer will be laid on a slope of 0.09 per cent and will have a capacity of about 155,000,000 gallons per day, which is a little greater than the combined capacities of the two interceptors above Hiawatha street.

The main intercepting sewer is to be constructed either of reinforced concrete or of segmental blocks. Manholes are to be placed at each point of change of alignment and at intermediate points not more than 500 feet apart. The changes of alignment of the sewer, however, will be made on a radius of 80 feet. The sewer is to be supported on piles placed 3 feet center to center longitudinally and about 3 feet 6 inches center to center transversely. The pipe is to be laid in private right of way and through State land for the greater part of its length. Where the sewer runs through low areas the pipe is to be back filled to a depth of not less than 2½ feet according to scale dimensions.

It is proposed to cross Onondaga creek near the upper end of the proposed extension by means of a double tube inverted siphon 103 feet long between the lower and upper entrance chambers. The siphon is to consist of two 48-inch pipes incased in concrete. These pipes are to be of ¼-inch lock-bar steel pipe, or class A iron pipe, or lock-joint type of reinforced concrete. A difference of elevation of 1.02 feet is provided between the invert elevation of the intercepting sewer above and below the siphon, thereby giving a hydraulic gradient of about 1 per cent so that one of the 48-inch pipes will have a carrying capacity of some 140 cubic feet per second. Under ordinary conditions of dry weather flow, only one of the two pipes will be in use. An overflow or relief weir with its crest about 4 feet above the invert of the main intercepting sewer is to be installed in the headhouse or upper entrance chamber between the two tubes of the siphon, and a similar weir is to be placed between the 2 pipes in the lower entrance chamber, so that ordinarily all of the sewage of the main interceptor will flow through one pipe until the sewage rises about 4 feet above the invert of the interceptor when the excess sewage will flow over the weir into the second tube of the siphon. Stop planks are also to be provided at the upper and lower ends of these tubes so that either of the 2 tubes may be closed off if desirable.

It would seem therefore that this extension to the main intercepting sewer of the city from Spencer street to the proposed disposal plant, so far as its capacity is concerned, will take the flow of the intercepting sewer above Spencer street and the contribution from the Harbor brook interceptor at Hiawatha street, and within this limitation of capacity might appropriately be approved. It should be clearly borne in mind, however, that in approving this sewer extension that this Department would not assume any responsibility

for the propriety of the design of the intercepting sewers above these points, either as to sizes, capacities, or grades, or as to any allowance or provision for storm water from sewers discharging into them. Although a limited allowance for inclusion of storm water has been provided in these intercepting sewers, storm overflows, as previously pointed out, are an inherent part of these systems; and if in the future any objectionable conditions arise in Onondaga creek, the Barge canal harbor, or in the lake itself, from these overflows, the responsibility for correcting them obviously rests entirely with the city.

With this clear understanding of the responsibility which the city must assume with reference to the intercepting sewers already constructed in the city, but in view of the urgent need for improving conditions with respect to sewage now discharged and creating a nuisance in Onondaga creek and the Barge canal harbor, and the appropriate capacity of the sewer extension from Spencer street to the proposed disposal works which will convey the sewage of the Onondaga and Harbor brook interceptors to the sewage disposal works, general plans for which have been submitted and will be subsequently reported upon, I beg to recommend that the plans for the intercepting sewer extension from Spencer street to the proposed disposal works now submitted be approved, and a permit be granted for the discharge of sewage therethrough into Onondaga lake, upon the following conditions:

1. That the proposed intercepting sewer extension shall be constructed in complete conformity with the plans or approved amendments thereof.

2. That before this intercepting sewer extension is put in operation, or any sewage discharged therethrough, sewage disposal works and outfall sewers shall be constructed to treat the sewage of the city, plans for which shall first be submitted to and receive the approval of the State Department of Health.

3. That on or before January 1, 1921, satisfactory detailed plans for sewage disposal works and outfall sewers shall be submitted to this Department for approval, and after the approval thereof said works and outfall sewers shall be constructed and put in operation at such time as the State Commissioner of Health may designate.

4. That no sewage overflow shall be constructed by the city of Syracuse to discharge into Onondaga creek, the Barge canal harbor, or the Barge canal between Plum street and Onondaga lake.

5. That whenever in the opinion of the State Commissioner of Health objectionable conditions occur resulting from the overflow of combined sewage, relief sewers shall be constructed to remedy the same, plans for which shall first be submitted to and receive the approval of the State Commissioner of Health.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *September* 1, 1920 — *Chief Engineer*

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 77 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Syracuse Intercepting Sewer Board to discharge sewage from the proposed main intercepting sewer extension into the waters of Onondaga lake, after such sewage shall first have been passed through and treated in sewage disposal works to be constructed by the city, within the city of Syracuse, Onondaga county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That the proposed intercepting sewer extension shown by the plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.

2. That before this intercepting sewer extension is put in operation, or any sewage discharged therethrough, sewage disposal works and outfall sewers shall be constructed to treat the sewage of the city, plans for which shall first be submitted to and receive the approval of the State Department of Health.

3. That on or before January 1, 1921, satisfactory detailed plans for sewage disposal works and outfall sewers shall be submitted to this Department for approval, and after the approval thereof said works and outfall sewers shall be constructed and put in operation at such time as the State Commissioner of Health may designate.

4. That no sewage overflows shall be constructed by the city of Syracuse to discharge into Onondaga creek, the Barge canal harbor, or the Barge canal between Plum street and Onondaga lake.

5. That whenever in the opinion of the State Commissioner of Health objectionable conditions occur resulting from the overflow of combined sewage, relief sewers shall be constructed to remedy the same, plans for which shall first be submitted to and receive the approval of the State Commissioner of Health.

M. NICOLL, JR.
September 2, 1920 *Acting State Commissioner of Health*

TONAWANDA (Town) (Dunlop America, Limited)

Plans were approved on September 27, 1920, for the disposal of sanitary sewage and trade wastes from the factory of the Dunlop America, Limited, in the town of Tonawanda, Erie county. The sewage from a population of 4,000 persons, estimated at about 100,000 gallons daily, is to be treated in a sewage disposal plant consisting of settling tanks and contact beds. The trade wastes, which contain no acids, caustics, or alkalies, have only certain impurities such as dirt, leaves, splinters, and other matter which are to be removed by settling basins. The permits issued in connection with the approval of the plans follow.

PERMITS

Application having been duly made to the State Commissioner of Health, as provided by section 78 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Dunlop America, Limited, to discharge partially treated trade wastes from the plant of said organization in the town of Tonawanda, into the waters of the Erie canal opposite their property, within the town of Tonawanda, Erie county, N. Y., in accordance with the plans accompanying the petition, under the following conditions::

1. That when necessary, sludge and settled deposits shall be removed from the proposed settlement tanks for trade wastes in such a manner as to cause no nuisance, and disposed of by burying in some remote place or in some other satisfactory manner without the creation of a nuisance.

2. That whenever required by the State Commissioner of Health the sewer carrying trade wastes shall be extended to the Niagara river under plans which must first be submitted to and receive the approval of this Department.

3. That whenever required by the State Commissioner of Health, satisfactory detailed plans for additional works for more complete treatment of the industrial wastes shall be submitted for approval; and upon approval of said plans any or all portions of such additional or supplementary works for more complete treatment of the industrial

wastes shall be constructed and put in operation at such time or times thereafter as said Commmissioner may designate.

M. NICOLL, JR.
Acting State Commissioner of Health

September 27, 1920

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Laws" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Dunlop America, Limited, to discharge sewage effluent from the proposed sewage disposal plant of said organization in the town of Tonawanda, into the waters of the Erie canal opposite their property, within the town of Tonawanda, Erie county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That both the sewer system and sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.
2. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sanitary sewers.
3. That when necessary sludge shall be removed from the proposed tanks in such a manner as to cause no nuisance, and disposed of by burying in some remote place or in some other satisfactory manner without the creation of a nuisance.
4. That no scum or sludge from any part of the disposal works shall be discharged into the Erie canal, Niagara river, or into any watercourse or body of surface water, or deposited where it may be carried thereinto by rain or melting snow.
5. That whenever required by the State Commissioner of Health, the sewer carrying sewage effluent shall be extended to the Niagara river under plans which must first be submitted to and receive the approval of this Department.
6. That whenever required by the State Commissioner of Health, satisfactory detailed plans for additional works for more complete treatment of the sewage shall be submitted for approval; and upon approval of said plans any or all portions of such additional or supplementary works for more complete treatment of sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.
Acting State Commissioner of Health

September 27, 1920

TONAWANDA (Town) (DuPont Fibersilk Company)

Plans were approved on September 2, 1920, for the disposal of sewage and trade wastes from the factory of the DuPont Fibersilk Company, in the town of Tonawanda, Erie county. The plans provided for the discharge of trade wastes (about 750,000 gallons daily) through a 54-inch sewer into the Erie canal and for the treatment of the sanitary sewage from a population of 700 persons by sedimentation only before its discharge into the Niagara river. The permits issued in connection with the approval of the plans follow:

PERMITS

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law," as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws permission is hereby given to the DuPont

Fibersilk Company, Inc., to discharge sewage effluent from the settling tank to serve the factory of said company in the town of Tonawanda, into the waters of Niagara river opposite their property, within the town of Tonawanda, Erie county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That on the sanitary sewer system a manhole be placed near the shore end of the flexible joint submerged outfall pipe.

2. That the proposed settling tank be so arranged that the sewage will enter it by means of a trough behind a baffle similar to the arrangement shown for the exit of the effluent.

3. That with the exception of the above conditions Nos. 1 and 2, the proposed works shown by the plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.

4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers for the collection of domestic sewage or to the proposed plant for the treatment of domestic sewage.

5. That when necessary the sludge shall be removed from the proposed tank in such a manner as to cause no nuisance, and disposed of by burying in some remote place, or on suitable sludge drying beds plans for which must first be submitted to and receive the approval of this Department before they are constructed.

6. That no sewage sludge from any part of the disposal works shall be discharged into the Erie canal or Niagara river or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.

7. That whenever required by the State Commissioner of Health, satisfactory detailed plans for additional works for more complete treatment or disposal of the sewage of the DuPont Fibersilk Company, Inc., shall be submitted for approval; and upon the approval of said plans any or all portions of such additional or supplementary works for more complete treatment or disposal of sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.

September 2, 1920 *Acting State Commissioner of Health*

Application having been duly made to the State Commissioner of Health, as provided by section 78 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the DuPont Fibersilk Company, Inc., to discharge trade wastes from the factory of said company in the town of Tonawanda, into the waters of the Erie canal, opposite their property, within the town of Tonawanda, Erie county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That the sewers conducting trade wastes into the trunk sewer be so arranged that should it be found that the wastes discharged by these sewers produce objectionable conditions, treatment plants shall be installed to treat the wastes, plans for which treatment plants must first be submitted to and receive the approval of the State Department of Health.

2. That whenever required by the State Commissioner of Health, the sewer carrying trade wastes shall be extended to the Niagara river under plans which must first be submitted to and receive the approval of the Department.

M. NICOLL, JR.

September 2, 1920 *Acting State Commissioner of Health*

Revised plans were approved on October 15, 1920, for the proposed sewerage system and disposal plant for the sanitary sewage from the factory of the DuPont Fibersilk Company, in the town of Tonawanda. The plans provided for a screen chamber, construction of siphons in duplicate, and extension of outfall pipe into the Niagara river, 150 feet from shore. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the DuPont Fibersilk Company to discharge effluent from the proposed disposal plant to care for the domestic sewage from the factory of said company in the town of Tonawanda into the waters of the Niagara river opposite their property within the town of Tonawanda, Erie county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That the platform for draining the screens be constructed of and supported by concrete and contain no apertures larger than ½-inch in diameter.
2. That the bar screen shall extend from side to side entirely across the screen chamber so that a screen with openings not wider than 2 inches shall be continuously maintained in front of both pipes on the siphon.
3. That with the exception of the recommendations 1 and 2 above, the sewerage system and sewage disposal works and outfall pipe shown by the plans shall be fully constructed in complete conformity with such plans or approved amendments thereof.
4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewage disposal works.
5. That no sewage sludge from any part of the disposal works shall be discharged into the Niagara river or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.
6. That when necessary the sludge shall be removed from the proposed tank in such a manner as to cause no nuisance, and disposed of by burying in some remote place.
7. That whenever required by the State Commissioner of Health, satisfactory detailed plans for additional works for more complete treatment of the sewage from the factory shall be submitted for approval; and upon the approval of said plans any or all portions of such additional or supplementary works for more complete treatment of sewage shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.

October 15, 1920 — *Deputy State Commissioner of Health*

TONAWANDA (Town) (Philadelphia Rubber Works Co.)

Plans were approved on June 25, 1920, for the disposal of sewage and trade wastes from the factory of the Philadelphia Rubber Works Company, in the town of Tonawanda, Erie county. The domestic sewage, according to the plans, will be collected by a system of sewers ranging from 6 to 10 inches in diameter, and treated in a disposal plant consisting of a settling tank and contact beds. The trade wastes from the factory will consist of about 1,000,000 gallons of wash water per day, which will be passed through a settling tank and screens and discharged, together with about 2,500,000

gallons of water used for cooling purposes, into the storm water sewer system. This sewer system will consist of mains varying from 8 to 54 inches in diameter, which will discharge the wastes and waste water into the Erie canal. The permits issued in connection with the approval of the plans follow:

PERMITS

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Philadelphia Rubber Works Company to discharge effluent from the proposed sewage disposal works to treat the domestic sewage from the factory of the company at Tonawanda, Erie county, N. Y., into the waters of the Niagara river at the point shown on the plans on the property of the company, within the town of Tonawanda, Erie county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That both the sewer system and the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof except that the contact beds shown need not be constructed until required by the State Commissioner of Health.

2. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers for the collection of domestic sewage or the sewage disposal plant for the treatment of domestic sewage.

3. That when necessary the sludge shall be removed from the proposed tank in such a manner as to cause no nuisance, and disposed of by burying in some remote place.

4. That no sewage sludge from any part of the disposal works shall be discharged into the Niagara river or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.

5. That whenever required by the State Commissioner of Health, the contact beds shown on the plans shall be constructed in complete conformity with the plans and put in operation at such time or times thereafter as said Commissioner may designate.

6. That in order to assure continuous operation the ejectors for lifting the domestic sewage over the bridge across the Erie canal be installed in duplicate

M. NICOLL, JR.
June 25, 1920 *Deputy State Commissioner of Health*

Application having been duly made to the State Commissioner of Health, as provided by sections 78 and 79 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Philadelphia Rubber Works Company to discharge trade wastes from their factory at Tonawanda, Erie county, N. Y., after settlement and screening, into the waters of the Erie canal at the point shown on the plans on the property of the company, within the town of Tonawanda, Erie county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That the sewerage system and the settling tank and screening plant for the collection and treatment of trade wastes shall be fully constructed in complete conformity with plans approved this day or approved amendments thereof.

2. That whenever required by the State Commissioner of Health. detailed plans for additional works for the more complete treatment of

the trade wastes from the factory of the Philadelphia Rubber Works Company at Tonawanda, Erie county, N. Y., shall be submitted for approval; and upon the approval of said plans any or all portions of such additional or supplementary works for more complete treatment of trade wastes shall be constructed and put in operation at such time or times thereafter as said Commissioner may designate.

M. NICOLL, JR.

June 25, 1920 *Deputy State Commissioner of Health*

TUCKAHOE

Plans were approved on June 22, 1920, for sewer extensions in Hollywood avenue, Bella Vista avenue, Hall street, and Dante avenue, in the village of Tuckahoe. The permit issued in connection with the approval of the plans contained in addition to the usual complete construction and storm water clauses, the following condition:

That when the extensions beyond the upper manholes shown on the plans on Hollywood and Bella Vista avenues are planned for construction, the plans for these extensions be first submitted to this Department for approval.

UNION

Plans were approved on July 14, 1920, for a sewerage system and temporary sewage disposal plant for a portion of the village and the town of Union. The report upon the examination of the plans and the permit issued in connection with their approval follow:

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on the examination of the plans for a sewerage system and temporary sewage disposal plant to serve a certain area owned by the Endicott-Johnson Corporation, lying partially in the northwest corner of the village of Union, Broome county, N. Y., and partially in the town of Union immediately adjacent to that corner of the village, submitted to this Department for approval by the Endicott-Johnson Corporation on June 30, 1920.

The records of this Department show that plans for a system of sewers covering a part of the area now under consideration were submitted to this Department for approval by the board of trustees of the village of Union in 1919, and approved on December 9 of that year, with the condition that before the sewers were put in use satisfactory plans for an intercepting sewer and sewage disposal works should be submitted to this Department for approval, and after approval put in operation whenever required by the State Commissioner of Health. The sewage from the district was, according to the plans, to be discharged into the Susquehanna river within the village and town of Union.

It now appears that the Endicott-Johnson Corporation has built and are building a number of houses in the district under consideration and desires to provide sewerage for these houses. The village authorities, however, do not deem it advisable to make any extensions to their sewerage system at the present time; and for that reason the Endicott-Johnson Corporation, which according to the statement in its application owns all the property in the district, including the streets, has prepared plans for the sewerage system to serve it and for the sewage disposal plant for temporarily disposing of the sewage collected. It is estimated by the designing engineer that the population of the district will ultimately reach about 1,000 persons, or the equivalent of about 12 persons per acre, or 6 persons per 100 feet of sewer. The plans include some of the streets shown on the plan approved by this Department on December 9, 1919, and modify some of the sewers shown on that plan reversing the direction of the flow on Jennings street and on Dwight street.

The plans as submitted contemplate the construction of about 3½ miles of vitrified tile sewer with the usual appurtenances, and the construction of a temporary disposal plant consisting of a sedimentation tank, pumping plant, and sand filter.

The sewers will be of tile pipe and consist of about 15,900 feet of 8-inch, 3,480 feet of 10-inch, and 1,700 feet of 12-inch pipe. Of this about 3,600 feet apparently do not drain to the temporary sewage disposal plant, and for that reason cannot be put in use until the new trunk sewer line and disposal plant are constructed. All sewers appear to be of sufficient size to carry the sewage that will probably reach them, and the grades will be sufficiently steep to provide self-cleansing velocities if the sewers are properly laid. The minimum grade on the 8-inch lines is 0.4 per cent, on the 10-inch lines 0.29 per cent, and on the 12-inch lines 0.21 per cent. Manholes are provided at frequent intervals, and at all intersections and changes in grade or alignment, the average distance between manholes being about 250 feet and the maximum distance about 400 feet.

The settling tank is a covered concrete structure divided into two compartments by a longitudinal wall. Each compartment is 11 feet 6 inches by 29 feet 6 inches in plan, and about 7 feet deep below the flow line. The flow line is, however, 6 inches above the crest of the outlet weir, and for that reason the net capacity of the tank is only about 32,000 gallons, the equivalent of approximately 8 hours average flow. The sewage will enter the tank at the center of the inlet ends of the compartments and leave over concrete weirs extending the full width of the outlet ends of the compartments. Transverse wooden baffles extending 12 inches below the level of the crest of the outlet weirs and set 18 inches from the inlet and outlet ends of the compartments are provided to distribute the flow evenly over the cross-section of the tank and prevent the escape of floating particles. The pipes at the inlet end of the tank are so arranged that the sewage may be turned into either or both of the tanks at the will of the operator. This will, of course, allow the sewage to be turned through one tank while the other tank is being cleaned, provided the water level in the adjacent pump chamber is kept below the crest of the outlet weir. Two manholes are provided in the roof of each compartment to afford access for inspection and cleaning.

According to the statement of the designing engineer, the sludge will be removed from time to time by pumping through the manholes, and carted to a remote place on one of the farms of the corporation and there finally disposed of by plowing in the ground.

Immediately adjacent to the outlet end of the settling tank and extending the full width of it will be a covered concrete pump chamber 25 feet 3 inches by 14 feet 10 inches in plan, and 3 feet 2 inches deep below the outlet weir of the tank or 4 feet 2 inches deep below the maximum flow line of the tank. The net capacity of the chamber will therefore be about 9,000 gallons or a little over 2 hours flow, while the total capacity including the 1 foot head available from the settling tank will be about 16,800 gallons or approximately 4 hours average flow.

The elevation of the roof of the settling tank and pump chamber is about 7 feet below extreme high water in the Nanticoke creek adjacent to the plant, and it is understood from the engineer's report that for that reason the tank and pump chamber will be made watertight.

A pumping plant will be installed just west of the settling tank and pump chamber, and between them and the sand beds, to lift the sewage from the tanks, the elevation of the flow line of which is to be 816.8, to the sand beds the elevation of the surface of which will be 818.0. The pumping plant will be housed in a building about 15 feet square with its floor raised above extreme high water level to protect the machinery from high water. The equipment will consist of one 4-inch single stage centrifugal pump rated at 600 gallons per minute, arranged to be driven by a 15-hp. three-phase motor or a 15-hp. gasoline engine. The motor and engine will be belt connected to the pump, and their operation will be manually controlled. Under normal conditions the pump will be operated by the motor and with current supplied from the factory of the Endicott-Johnson Corporation. The gasoline

engine will be held in reserve for use in case of failure of the electric power.

Five sand beds will be provided, each 100 by 80 feet in size, making the total area about 0.9 of an acre, and the rate of filtration based on a flow of 100 gallons per capita per day about 110,000 gallons per acre per day. The filter material will consist of from 3 feet to 3 feet 6 inches of sand, having an effective size of 0.25 mm. and a uniformity coefficient of not over 3, resting on a 2-inch layer of coarse sand. The sewage will be distributed over the beds by means of wooden troughs and the effluent collected by single lines of 12-inch tile pipe laid in gravel along the center of each bed. These underdrains will connect to a 12-inch main drain which will discharge into Nanticoke creek near the plant. The arrangement of the underdrains is therefore such that the distance from the sides of the beds to the drain will be about 40 feet, a distance which seems too great to assure satisfactory draining of the beds, particularly as no layer of coarse gravel or broken stone is according to the plans to be provided under the sand. It would seem desirable therefore that the spacing of the underdrains should be reduced, and that a layer of gravel or broken stone should be provided on the bottom of the beds to facilitate the passage of the effluent to the underdrains. The maximum dose from the pump station will be, as stated above, 16,800 gallons, or the equivalent to a depth of about 3½ inches on one sand bed. Manually operated valves will be provided for turning the flow on to any bed at the option of the operator.

As noted on June 30 by an engineer in this Department, in an interview with the engineer of the proposed plant, the distribution and drainage system of the filter should be made uniform. At present the section of filter surface in which the words "Distributing Trough" appear, has an area of 200 square feet supplied from a trough-lip length of 100 feet, while the section in which occurs the word "Underdrain" has an area of 100 square feet and a lip of 120 feet, apparently giving one area between two and three times the intensity of application of the other. Hence the regulation of lip elevations or perforations must be carefully worked out and the surface grading properly maintained to guard against uneven distribution.

The elevation of the surface of the beds will be 818.0 or 7 feet below extreme high water in the creek, and in order to protect the beds in time of such high water an embankment will be constructed around them and carried up above the highest elevation that the water will probably reach. A check valve will be provided on the outlet from the beds to prevent the river water from backing up into them. This arrangement will not of course prevent the beds from becoming flooded during periods of high water, for while it may not be possible for the river water to enter the beds the sewage will not be able to escape into the river and will therefore rise on the beds. The condition thus created will undoubtedly deleteriously affect the efficient operation of the beds, but since at such times the dilution will be large it is probable that no unsatisfactory condition will be created if the filters are operated with proper care.

It is understood from the engineer's report that this disposal plant is for temporary use only, and that it is intended in a few years to construct and put in operation an intercepting sewer and disposal plant for the treatment of the sewage of the village and the adjacent district, and that the sewage collected by the system at present under consideration will be ultimately connected to this intercepting sewer and disposal plant.

In view of the above facts, and after a careful consideration of the essential features of the design and of general and local conditions, I would recommend that the plans be approved and a permit issued to the Endicott-Johnson Corporation allowing the discharge of the effluent from the proposed temporary sewage disposal plant into the waters of Nanticoke creek at the point shown by the plans on the property owned by the corporation in the town of Union, Broome county, N. Y., with the following conditions:

1. That both the sewer system and the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof. except where variations are expressly required by the conditions of this permit.

2. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers and sewage disposal works.

3. That when necessary the sludge shall be removed from the proposed tank in such a manner as to cause no nuisance, and disposed of by burying or ploughing into the ground in some remote place.

4. That no sewage sludge from any part of the disposal works shall be discharged into Nanticoke creek or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.

5. That the spacing of the underdrains of the sand bed be reduced to not greater than 15 feet center to center, and that the bottom of the bed be properly graded and covered with gravel or broken stone of suitable size in order to facilitate the draining of the beds.

6. That, before that portion of the proposed sewerage system shown on the plans approved this day and not draining to the temporary sewage disposal plant, is put in use, satisfactory plans for an intercepting sewer and sewage disposal works for the treatment of the sewage from that portion of the sewerage system shall be submitted to this Department for approval; and that after the approval of said plans any or all parts of such intercepting sewer and sewage disposal plant shall be constructed and put in operation.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *July* 13, 1920

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 78 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Endicott-Johnson Corporation to discharge effluent from the proposed temporary sewage disposal plant to serve the property of said corporation in the town and village of Union, near Nanticoke creek, into the waters of Nanticoke creek at the point shown by the plans on the property owned by the corporation, within the town of Union, Broome county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That both the sewer system and the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof, except where variations are expressly required by the conditions of this permit.

2. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers and sewage disposal works.

3. That when necessary the sludge shall be removed from the proposed tank in such a manner as to cause no nuisance, and disposed of by burying or ploughing into the ground in some remote place.

4. That no sewage sludge from any part of the disposal works shall be discharged into Nanticoke creek or any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.

5. That the spacing of the underdrains of the sand bed be reduced to not greater than 15 feet center to center and that the bottom of the bed be properly graded and covered with gravel or broken stone of suitable size in order to facilitate the draining of the bed.

6. That before that portion of the proposed sewerage system shown on the plans approved this day and not draining to the temporary sewage disposal plant is put in use, satisfactory plans for an intercepting sewer and sewage disposal works for the treatment of the sewage from that portion of the sewerage system shall be submitted to this Department for approval; and that after the approval of said plans any or all parts of such intercepting sewer and sewage disposal plant shall be constructed and put in operation.

M. NICOLL, JR.
Deputy State Commissioner of Health

July 14, 1920

WATERFORD (State Commission of Highways)

Plans were approved on July 14, 1920, for the disposal of sewage from the storehouse of the State Commission of Highways in the village of Waterford. The plans provided for the treatment of the sewage in a septic tank and its discharge into the Barge canal. No permit was issued in connection with the approval of the plans.

WATERTOWN

Plans were approved on January 7, 1920, for a proposed sewer in Dewey street, in the city of Watertown. On June 15, 1920, plans were approved for proposed sewers in Palmer street, in the city of Watertown. The permits issued in connection with the approval of these plans contained only the usual revocation, modification, complete construction, and storm water clauses.

WOLCOTT (Town) (Leavenworth Institute and Wolcott High School)

Plans were approved on February 21, 1920, for a sewage disposal plant to serve the Leavenworth Institute and Wolcott High School, in School District No. 1 of the town of Wolcott, Wayne county. The plans provided for a sewage disposal plant consisting of a settling tank, dosing chamber, and subsurface irrigation system. The permit issued in connection with the approval of the plans follows:

PERMIT

Application having been duly made to the State Commissioner of Health, as provided by section 76 of chapter 49 of the Laws of 1909, the "Public Health Law" as amended by chapter 553 of the Laws of 1911, constituting chapter 45 of the Consolidated Laws, permission is hereby given to the Board of Education of School District No. 1, in the town of Wolcott, to discharge the effluent from the proposed sewage disposal plant to serve Leavenworth Institute and Wolcott High School into the ground waters of the State tributary to Wolcott creek, within the municipality of Wolcott, Wayne county, N. Y., in accordance with the plans accompanying the petition, under the following conditions:

1. That this permit shall be revocable at any time or subject to modification or change when in the judgment of the State Commissioner of Health such revocation, modification, or change shall become necessary.
2. That the issuance of this permit shall not be deemed to affect in any way action by this Department on any future application that may be made for permission to discharge additional sewage or effluent into the waters of this State.
3. That the sewage disposal works shown by plans approved this day shall be fully constructed in complete conformity with such plans or approved amendments thereof.
4. That only sanitary or domestic sewage and no storm water or surface water from streets, roofs, or other areas shall be admitted to the proposed sewers.
5. That the length of tile in the subsurface irrigation field be made such that the total length will be equivalent to 5 feet for each pupil attending the school, and that should the number of pupils increase the number of feet of tile in the field shall be correspondingly increased, or other satisfactory methods of final disposal provided.
6. That the sludge be removed from the settling tank when necessary in such a manner as to cause no nuisance, and be disposed of by burying in some remote place.
7. That no sludge or sewage from any part of the proposed sewage disposal works shall be discharged or allowed to flow into Wolcott creek or into any other watercourse, or deposited on the ground where it may be washed by rain or melting snow into any watercourse.

M. NICOLL, JR.
February 21, 1920 *Deputy State Commissioner of Health*

INDIVIDUAL PERMITS ISSUED DURING 1920, AS PROVIDED BY ARTICLE V OF THE PUBLIC HEALTH LAW

LOCATION	To whom issued	1920	Waste matter	Discharged into
Bedford (Town), Westchester county.	Mr. E. O. Holter	Mar. 9	Effluent from proposed sewage disposal plant to serve cottage (see page 20).	Ground waters tributary to Croton lake.
Beekman (Town), Dutchess county.	The Hopewell Realty Company	June 11	Sewage from under-drainage of leaching cesspools for Sylvan Lake Camp (see page 21).	Ground waters tributary to Sylvan lake.
Briarcliff Manor, Westchester county.	Briarcliff Manor Realty Company	Feb. 21	Effluent from proposed addition to disposal plant serving Briarcliff Manor (see page 22).	Ground waters tributary to Pocantico river.
Brookhaven (Town), Suffolk county.	Board of Managers, Suffolk County Tuberculosis Hospital.	Dec. 8	Effluent from proposed disposal plant (see page 25).	Ground waters tributary to Patchogue creek.
Canaan (Town), Columbia county.	Board of Trustees, School District No. 1.	April 22	Effluent from sewage disposal plant to serve school (see page 30).	Ground waters tributary to Stony Kill.
Chemung (Town), Chemung county.	Keystone Dairy Company, Inc.	Sept. 28	Effluent from cesspool to treat the waste water and washings from factory.	Ground waters tributary to Chemung river.
Claverack (Town), Columbia county.	States Metals Company	Sept. 2	Effluent from proposed sewage disposal plant for factory (see page 31).	Claverack creek.
Claverack (Town), Columbia county.	States Metals Company	Sept. 2	Effluent from proposed plant for treatment of trade wastes from factory (see page 32).	Claverack creek.
Columbus (Town), Chenango county.	Phenix Cheese Company	Nov. 11	Waste water and washings, cooling and condensing water, and sewage from plant (see page 37).	Unadilla river.
Cortlandt (Town), Westchester county.	Baron de Hirsch Fund	Jan. 6	Effluent from proposed plant to serve Baron de Hirsch Agricultural School (see page 38).	Tributary of Peekskill Hollow creek.
DeRuyter, Madison county	DeRuyter Cooperative Association, Inc.	Aug. 24	Effluent from tank to treat waste water and washings from factory.	East branch of Tioughnioga creek.
Dundee, Yates county	Dairymen's League Cooperative Association, Inc.	Oct. 19	Effluent from tank to treat waste water and washings from factory.	Tributary of Big stream.
Easthampton (Town), Suffolk county.	Fisheries Products Company	May 22	Effluent from works to treat trade wastes and domestic sewage from factory (see page 42).	Gardiners bay and ground waters tributary to Gardiners bay.
Ghent (Town), Columbia county.	Board of Trustees, School District No. 3.	May 20	Effluent from proposed sewage disposal plant to serve the school (see page 49).	Ground waters tributary to Kline Kill.
Greene, Chenango county	Mr. Ed. Bixby	May 5	Sewage from property	Chenango river.
Greenport (Town), Columbia county.	Board of Trustees, School District No. 1, town of Greenport.	Oct. 19	Effluent from proposed disposal plant of school (see page 50).	Ground waters tributary to Hudson river.
Hamburg (Town), Erie county	Erie County Agricultural Society	Sept. 23	Effluent from proposed sewage disposal plant at fair grounds (see page 51).	Tributary of Rush creek.
Hastings (Town), Oswego county.	Porter Products Corporation	July 9	Effluent from tanks for treatment of sewage at factory.	Oneida river.
Hempstead (Town)	Board of Education School District No. 22, town of Hempstead.	Nov. 27	Effluent from leaching cesspools to serve school (see page 52).	Ground waters tributary to Atlantic ocean.

Hume (Town), Allegany county.	Richardson Beebe Company	Oct.	19	Effluent from settling tank to treat waste water and washings from condensery.	Genesee river.
Jefferson (Town), Schoharie county.	Jefferson Dairymen's League Co-operative Association, Inc.	July	19	Effluent from tanks to treat waste water and washings from creamery.	Middle brook.
Lenox (Town), Madison county.	I. J. Chapman & Son	Aug.	3	Wastes and wash water from creamery	Ground waters of this State.
Liberty (Town), Sullivan county	Loomis Sanatorium	Mar.	12	Effluent from proposed plant to serve sanatorium (see page 55).	Tributary of Mangaup river.
Liberty (Town), Sullivan county	Loomis Sanatorium	April	8	Effluent from plant to serve sanatorium (see page 58).	Tributary of Mangaup river.
Lisbon (Town), St. Lawrence county.	W. J. Murphy	April	29	Effluent from proposed sand filters to treat waste water and washings from factory near Flackville.	Ground waters of this State.
Middleburg, Schoharie county	Board of Education School District No. 1, town of Middleburg.	July	9	Effluent from plant at High School (see page 68).	Ground waters tributary to branch of Schoharie creek.
Naples, Ontario county	Steuben Products Company	June	11	Effluent from ensilage pit and sand filter (see page 69).	Ground waters and a tributary of Naples creek.
Newfield (Town), Tompkins county.	Board of Education School District No. 2, town of Newfield.	Jan.	31	Effluent from proposed disposal plant to serve school (see page 70).	Ground waters tributary to West Branch of Cayuga Inlet.
Newstead (Town), Erie county.	Akron Manufacturing Company	Sept.	27	Effluent from tank to treat sanitary sewage from factory.	Swamp north of village of Akron
Newstead (Town), Erie county.	Wheat's Ice Cream Company	Sept.	27	Effluent from tank to treat sanitary sewage from factory.	Swamp north of village of Akron.
New Windsor, Orange county	Board of Trustees, School District No. 1, town of New Windsor.	Aug.	3	Effluent from proposed system of leaching cesspools. (see page 71).	Ground waters tributary to Hudson river.
Nunda, Livingston county	Peck & Pratt Condensed Milk Company.	Jan.	7	Effluent from plant to treat trade wastes of condensery (see page 72).	Keshequa creek.
Nunda, Livingston county	Peck and Pratt Condensed Milk Company.	Jan.	7	Effluent from plant to treat domestic sewage from condensery (see page 73).	Ground waters tributary to Keshequa creek.
Orwell (Town), Oswego county.	Dr. P. D. Bailey	April	20	Effluent from sewage disposal plant for sanatorium (see page 74).	Orwell creek.
Oyster Bay (Town), Nassau county.	Board of Trustees, School District No. 12, town of Oyster Bay.	Aug.	30	Effluent from system of leaching cesspools (see page 75).	Ground waters tributary to Atlantic ocean.
Paris (Town), Oneida county	Clayville Knitting Company	Sept.	14	Effluent from disposal plant to treat sewage from property (see page 79).	Saquoit creek.
Savannah, Wayne county	Shefford Cheese Company, Inc.	Sept.	17	Effluent from settling tank to treat waste water and washings from factory.	Tributary of Crusoe creek.
Shandaken (Town), (Chichester) Ulster county.	Department of Water Supply, Gas and Electricity of city of New York.	Sept.	22	Effluent from proposed sewage disposal plant to treat sewage from village (see page 92).	Ground waters tributary to Stony Clove branch of Esopus creek.
Sidney (Town), Delaware county.	Beakes Dairy Company	May	28	Effluent from settling tank to treat waste water and washings from creamery.	Tributary of Carrs creek.
Stark (Town), Herkimer county.	John R. Snyder	Aug.	11	Effluent from settling tank to treat waste water and washings from Van Hornesville cooperative cheese factory.	Tributary of Otsquago creek.
Stony Point (Town), Rockland county.	Board of Education, School District No. 5, town of Stony Point.	Aug.	18	Effluent from sewage disposal plant to serve Tompkins Cove High School (see page 93).	Ground waters tributary to Hudson river.
Tonawanda (Town), Erie county	Dunlop America, Limited	Aug.	18	Partially treated trade wastes from factory (see page 98).	Erie canal.

INDIVIDUAL PERMITS ISSUED DURING 1920 — *(Concluded)*

LOCATION	To whom issued	1920	Waste matter	Discharged into
Tonawanda (Town), Erie county	Dunlop America, Limited.........	Sept. 27	Effluent from proposed sewage disposal plant to treat domestic sewage from factory (see page 98).	Erie canal.
Tonawanda (Town), Erie county	DuPont Fibersilk Company, Inc..	Sept. 2	Effluent from tank to treat sewage of factory (see page 99).	Niagara river.
Tonawanda (Town), Erie county	DuPont Fibersilk Coumpany, Inc.	Sept. 2	Trade wastes from factory (see page 100)....	Niagara river.
Tonawanda (Town), Erie county	DuPont Fibersilk Company, Inc..	Oct. 15	Effluent from disposal plant to treat domestic sewage from factory (see page 101).	Niagara river.
Tonawanda (Town), Erie county	Philadelphia Rubber Works Company.	June 25	Effluent from plant to treat domestic sewage from factory (see page 102).	Niagara river.
Tonawanda (Town), Erie county	Philadelphia Rubber Works Company.	June 25	Trade wastes from factory after sedimentation and screening (see page 102).	Erie canal.
Union (Town), Broome county.	Endicott-Johnson Corporation....	July 14	Effluent from temporary sewage disposal plant to serve property in town and village of Union (see page 106).	Nanticoke creek.
Winfield (Town), Cedarville, Herkimer county.	Levy Dairy Company............	Dec. 31	Effluent from cesspools for wash water and sewage from milk station and factory.	Ground waters tributary to branch of Unadilla river.
Wolcott, Wayne county........	Board of Education, School District No. 1, town of Wolcott.	Feb. 21	Effluent from proposed plant to serve Leavenworth Institute and Wolcott High School (see page 107).	Ground waters tributary to Wolcott creek.

GENERAL INVESTIGATIONS RELATING TO SEWERAGE AND SEWAGE DISPOSAL

In addition to the above work of examining and passing upon plans for sewerage and sewage disposal, investigations of the conditions of existing sewerage and sewage disposal systems have been made in the following places during 1920:

EAST SYRACUSE

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on an investigation of the conditions of sewerage and sewage disposal of the village of East Syracuse, with special reference to the resulting pollution of Headson and Lye creeks, made on June 16 and 17, 1920, by W. C. Emigh, Assistant Engineer in this Department.

The incorporated village of East Syracuse is located in the east central part of Onondaga county, about four miles east of the city of Syracuse, on the main lines of the New York Central and West Shore railroads. The village lies between two streams: Butternut creek, which is about 1½ miles to the east of the center of the village, and Headson creek, which is about ⅛ mile to the west of the center of the village. Butternut creek flows northeast, its waters eventually reaching Oneida lake. Headson creek flows northwest into Lye creek, and thence into Onondaga lake.

In recent years the village has shown a steady increase in population. Census returns indicate in 1905, 2,996; in 1910, 3,274; in 1915, 3,839. The present population is estimated at about 4,000. One of the largest railroad yards in the State is located in this village. A metal ware factory within the corporation limits employs about 200 persons. The supply for a municipally owned water system is obtained by gravity from springs about seven miles south of the village. This water is distributed without filtration. Practically all of the population is connected to the water system. The average per capita consumption is about 80 gallons.

The sewer system consists of approximately 7½ miles of sanitary sewers, varying in size from 6 to 18 inches. About 75 per cent of the population is connected, or approximately 3,000 persons. A considerable ground water infiltration has always taken place in these sewers which, during the greater part of the year, is probably equal to, or greater than, the sewage contributed.

Sewerage System Plans and Construction

The records of this Department show that on December 21, 1900, original plans for sewers and sewage disposal works for the village of East Syracuse were approved by the Department. (See 21st Annual Report, page 84.) These plans provided for a separate sewer system, a receiving well, pumping equipment, and a chemical precipitation sewage disposal plant. The entire pumping and disposal plant was to be located near the intersection of Second and Henry streets and near the developed section of the village. Certain portions of the system as designed included sewers at a depth as great as 17 feet below ground surface. The receiving well was to be circular. Above the well was to be installed the pumping equipment which was in duplicate, a sludge press and tanks for the chemical to be used in inducing precipitation. After application of chemicals the sewage was to be pumped into 4 precipitation tanks. The effluent from these tanks was to be discharged by gravity flow through some 5,600 feet of 15-inch sewer into Butternut creek.

The construction of this sewerage system was delayed and in 1902 the question of substituting a gravity system with outlet into Headson creek in place of pumping into Butternut creek was raised by the village authorities. A report was submitted to the village by Mr. George Rafter in 1902, stating the relative merits of the case. It does not appear, however, that plans for such a gravity system to discharge into Headson creek were prepared at that time.

On November 11, 1904, plans were approved by this Department for a thoroughly revised system of sewage disposal works (see 25th Annual Report, page 382). At that time the sewerage system provided for by the original plans, with the exception of the disposal plant, was under construction and nearly completed. A receiving well was in course of construction but in accordance with the new plans. These plans included radical modifications over those of 1900. Under the plans of 1904 a receiving well was to be located at the same point as shown on plans of 1900, but it was to consist of two chambers so arranged that either or both might be used in connection with either or both of the pumps which were to be in duplicate. This detail of design evidently possessed some advantages over the former design in facility for cleaning the well. The sewage was to be pumped from this receiving well in an easterly direction through an 8-inch castiron force main to a grit chamber. Thence it was to flow by gravity to a settling tank and into the siphon dosing chamber from which it was to pass to sand filter beds. This plant was to be located on the town line road about 8,300 feet easterly from the receiving well and about 2,000 feet east of Butternut creek. From these filter beds the effluent was to flow westerly through a 10-inch tile pipe to the point of discharge into Butternut creek. At the point of crossing Butternut creek, the force main was provided with a valve intended to permit the sewage to be discharged directly into the creek should occasion arise for bypassing the disposal plant. When this valve was opened it would be necessary to pump against only 15 feet of hydrostatic head whereas to pump into the disposal plant would involve 45 feet of head. Automatic control was provided for the pumps.

The laying of the sewers was not completed until 1906. The pumping plant was installed in June, 1906. The disposal plant was accepted in the spring of 1907. The total outlay involved was about $80,000. Pumping equipment consisted of one 8-inch vertical centrifugal pump driven by one 20-horsepower induction motor in place of the duplicate equipment provided in the plans. In the process of construction a considerable quantity of ground water was encountered. The rate of infiltration into the sewers was high with a correspondingly high cost of pumping. In 1907 before the disposal plant had been placed in operation and while pumping directly into Butternut creek against a head of only 15 feet, the cost of pumping had reached $500 per month. At times it was impossible to prevent sewage from rising in some manholes due to the heavy infiltration of ground water into the sewers.

On February 19, 1908, application was made by the board of sewer commissioners for the approval of plans for an overflow from the village sewer system into Headson creek. On March 7, 1908, an engineer from this Department was sent to East Syracuse to consult with the village authorities and their engineer. As a result of this conference and from data obtained at that time and a subsequent study of the situation certain suggestions were made by this Department. On February 10, 1909, plans prepared in general accordance with the recommendations of this Department were approved (see 30th Annual Report, Vol. II, page 46). These plans provided for the elimination of the low level or deep sewers and the construction of a high level intercepting sewer in the easterly portion of the village; for the reversal of the direction of flow of sewage in certain sections; and for the conveyance of the entire sewage of the village to a sewage disposal plant consisting of septic tanks and contact beds to be located along Headson creek, some 400 feet northeast of the intersection of James and Manlius streets. These plans further showed a temporary septic tank to be located on the permanent line of the trunk sewer at a point in close proximity to the right of way of the

freight line of the New York Central and Hudson River railroad, and about 600 feet down stream from the point of confluence of Marcey and Headson creeks. At the time of the approval of these plans permission was also granted for the construction of a temporary septic tank at this location having effective dimensions of 60 feet x 26 feet x 6 feet. This permit terminated on March 1, 1914, at which time a complete permanent sewage disposal plant was to have been completed and placed in operation.

On October 3, 1910, amended plans for sewerage and sewage disposal of the village were submitted to this Department. (See 31st Annual Report, page 500.) These plans showed that it was proposed to construct two permanent settling tanks at a point near the intersection of Elm and Maple streets, which point is about 800 feet southerly and upstream from the point at which it was proposed in the plans of the preceding year to construct temporary tanks for which construction permission had been granted. This proposed point of location is 200 feet above the junction of Marcey and Headson creeks. It was requested that permission be granted to temporarily discharge the effluent from the settling tanks into Marcey creek above its confluence with Headson creek. These plans further provided for the ultimate extension of the effluent pipes of the proposed settling tanks to contact and filter beds to be located north of the village about 3,000 feet distant from the settling tanks. Approval of these plans was not granted.

An inspection of the sewage disposal plant of the village made by a representative of this Department on December 8, 1914, in connection with the general investigation being carried on at that time of sewage disposal plants in the State, showed that a temporary septic tank, 13 feet x 48 feet x 6½ feet had been constructed and was in use. This tank provided an effective volume only 44 per cent as large as would have been provided in the tank specified in the temporary permit. The effluent at that time was being treated with a solution of hydrochlorite of lime before its discharge into the stream. Furthermore, this tank had been constructed at a point about 700 feet distant from the location approved for the temporary tank and near the location for which approval was refused in 1910. It was also found that the tank, due to its inadequate size and to the fact that it was practically filled with sludge and scum, gave very unsatisfactory results. It was therefore recommended that a permanent plant be constructed at once, and that until such time as such plant should be completed, the present plant be placed and maintained in an effective operating condition.

On May 29, 1915, plans were submitted to this Department showing details of certain sewers and of sewage disposal works which it was proposed to construct. These proposed new works embodied the extension of the trunk sewer from a temporary settling tank as constructed a distance of 6,200 feet following in general the line of Headson creek to the site of the proposed disposal plant. This proposed site is located about 3,300 feet down stream from the proposed location of the disposal plant as shown in the plans submitted and approved in 1909. From the disposal plant an outfall sewer is shown following the line of the stream a distance of 4,300 feet. Plans of the proposed disposal works show a preliminary settling tank of the Imhoff type, a dosing tank equipped with automatic siphons, a sprinkling filter, a final settling tank likewise of the Imhoff type and a sludge drying bed (36th Annual Report, Vol. II, page 80). After certain revisions of these plans, including the design of a coarse screen, had been made, they were approved July 23, 1915. A proposition to raise funds for the construction of the trunk sewer and disposal plant, as shown by the last plans approved was voted on by the taxpayers and defeated August 16, 1916. Since that time it appears that no move has been made for a reconsideration of this proposition.

During the year 1911 complaint was made by the owners of certain dairy farms which adjoin Headson and Lye creeks, in the towns of DeWitt and Salina, stating that municipal and industrial wastes discharged into these creeks were causing pollution of the same. This complaint was followed by a suit in which the village of East Syracuse, the Syracuse Rendering Company, the New York Central and Hudson River Railroad Company, and the Benedict Manufacturing Company were named as codefendants. A verdict

was rendered in favor of the plaintiffs; the case was appealed and the verdict sustained about the first of the year 1918.

Existing Sewerage Conditions

On June 1, 1920, a communication was received from Mr. Charles A. Ray, of East Syracuse, stating that the Syracuse Rubber Company, manufacturers of rubber tires, had recently erected a manufacturing plant in the vicinity of Lye or Headson creek within the corporate limits of East Syracuse, and that it was his understanding that the village of East Syracuse had granted that company permission to drain the sewage of its plant into Lye creek through the municipal sewer system, and that for this purpose the village was about to allow the connection of this manufacturing establishment with the East Syracuse village system. The complainant further referred to a past report of this Department, in which insanitary conditions were noted and expressed his belief that to add materially to the volume of sewage in the village sewer system would aggravate a condition already objectionable.

Upon investigation it was found that the conditions existing, as regards village sewerage, at the time of the inspection of December 8, 1914, to which reference has been made, and detailed in a report thereof (see 36th Annual Report, Vol 2, page 1077), had in general been only slightly changed. The bulk of the sewage is conducted to a concrete settling tank previously described in connection with the investigation of 1914. This tank is covered with a roof composed of plank, some of which are loose. It is estimated that the volume of sewage entering the tank would receive, if the entire volume of the tank were available, a theoretical detention of 1½ hours. There was in the tank a considerable quantity of sludge and thick tough scum. That it has been the practice to remove these accumulations is shown by quantities of dry sewage solids on nearby land. From this tank the effluent passes through a manhole and into the stream, a distance of about 50 feet. Over the manhole is a small frame building housing a Wallace and Tiernan chlorinating apparatus. The chlorine is applied in the manhole. No provision is made for detention during the process of disinfection other than such as is obtained in the slow current of the creek. The dilution obtained in the waters of the stream effects a similar reduction in the proportion of chlorine. This disinfecting plant supplanted a hypochlorite apparatus which was described in the report of the 1914 investigation.

Recently the village of East Syracuse voted to annex some 39 acres located immediately adjacent to its former east boundary line and upon which is located the new plant of the Syracuse Rubber Company. At this plant it was found that a settling tank, 12 feet x 12 feet in plan, had been built near the freight line right of way of the New York Central railroad. The tank was constructed of vertical plank sheathing held in place by a timber frame. The contents of this tank plainly indicated that sanitary sewage was entering it. The effluent was piped underground 30 feet to a point in the bed of a ditch inside the railroad right of way. It then flowed in this ditch over the right of way a distance of about 400 feet to Headson creek, into which it discharged near the railroad bridge about 700 feet down stream from the point of discharge of the village sewage. No plans showing this tank and method of disposal of sanitary sewage and trade wastes have been submitted to this Department, nor has any application been made by this company or by the village in their behalf for permission to discharge sewage from this industrial plant into the waters of Headson creek. This discharge of sewage into the waters of the State without permission constitutes a violation of section 79 of the Public Health Law. Application should be made immediately by the Syracuse Rubber Company for temporary permission to discharge sewage and wastes from their plant into the waters of Headson creek. This application should be accompanied by plans in duplicate showing details of construction of sewers and disposal plant together with the location of the proposed point of discharge into the creek.

It was stated by Dr. B. F. Chase, Health Officer of the village of East Syracuse, that he understood this method of treatment to be temporary only, and that the village engineer had been instructed to prepare plans for a plant

to treat the sewage of this manufacturing establishment. He further stated that the village of East Syracuse had purchased certain property rights, including a right of way across the road bed of the New York Central railroad, for purposes of treatment and disposal of this sewage. It appears from such information as could be obtained that it is intended to discharge the effluent of this plant into the stream at a point about 500 feet down stream from the present point of discharge, or about 1,200 feet down stream from the present village outfall.

In general the slope of the bed of Headson creek is slight and the resulting current moderate, in some places sluggish. After passing under the tracks of the New York Central railroad it passes between the railroad right of way and the rear of a number of houses located on Manlius street. A considerable quantity of suspended solids was seen in the stream in this section. The stream then crosses Manlius and James streets in a well built-up section. Thence it flows in the town of DeWitt in a northeasterly direction mainly through an agricultural section, but passes near several farm houses. About ⅜ of a mile below James street the stream crosses a highway at a point not far distant from a large industrial plant now under construction. This plant is owned by the M. L. Oberdorfer Brass Company. As the proposed location of the sewage disposal plant, shown on the plans approved in 1915, is some ⅝ miles below this highway crossing, it will be possible for the village of East Syracuse to care for the sewage of this section if it appears desirable.

Conclusions and Recommendations

As a result of this investigation, together with the results of previous investigations and data at hand, and after a careful consideration of the various factors involved, I am of the opinion that the sewage discharged into Headson creek by the village of East Syracuse at present does not create a serious and unwarranted pollution of that stream.

I would therefore recommend:

1. That the village of East Syracuse be required to construct trunk sewers and a sewage disposal plant in conformity with the plans approved by this Department on July 23, 1915.
2. That the sewage of the Syracuse Rubber Company, a manufacturing corporation within the corporate limits of the village, be conducted to this trunk sewer at the most suitable point and that it be treated with the sewage of the village of East Syracuse.
3. That the Syracuse Rubber Company prepare and submit plans to this Department showing temporary method of disposal of sewage and wastes together with application for permission to discharge same into Headson creek, as outlined in the body of this report.

I would further recommend that copies of this report be sent to the Sanitary Supervisor of the District, the Board of Health of the village of East Syracuse, the Syracuse Rubber Company, and the complainant.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *August* 16, 1920

Copies of this report were sent on August 17, 1920, to the village authorities and to the Syracuse Rubber Company, and they were urged to carry out the recommendations of the report.

GLENS FALLS

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on the results of an inspection made by an engineer of this Department on October 30, and November 1 and 2, of the alleged insanitary conditions caused by the discharge of sewage

into the Sherman Quarry, owned and operated by the F. W. Waite Lime Company, within the city of Glens Falls, Warren county, N. Y., as complained of in a letter received from the Industrial Commission of the State Department of Labor on October 19, 1920.

General Situation

Glens Falls has a population of about 16,500 persons, and is located on the Hudson river about 60 miles north of Albany. The nearest populated places on the Hudson below Glens Falls are the villages of Hudson Falls and Fort Edward. These municipalities are located about 2 and 4 miles respectively below Glens Falls, and have a combined population of about 10,000 persons. Neither of these villages, however, nor any other municipality below them on the river, use the latter as a source of water supply without purification.

Approved Plans

The records of the Department show that plans for a sewer system for the city of Glens Falls were approved on October 14, 1891, as described in our 12th Annual Report. The sewer system provided for by these plans was constructed in general accordance therewith. The system, however, was rapidly outgrown and extensively added to so that new plans were necessary. Such plans were submitted to the Department and received approval on February 27, 1918. These latter plans embraced a complete system of sewage disposal, and included three pumping stations to care for low undeveloped portions of the city. The treatment comprised screen and grit chamber, three settling tanks of the two-story type with five sludge drying beds, and a submerged outfall discharging at a point near the center of the Hudson river. No steps, however, appear to have been taken to install the proposed sewage disposal plant provided for by these 1918 plans.

Original Disposal Conditions

The system approved in 1891 provided for the disposal of sewage by discharging it into a large fissure, crevice, or sink hole in the lime rock around which was built a covered brick tank vented by a central chimney. This tank prevented the horizontal flow of sewage, at times of violent storm discharges, from jumping over the sink hole, and confined the sewage so that its disposal might be fully accomplished without its being seen or odors from it noticed.

Limitations of Original Disposal Method

No point of issue of the sewage from the sink hole crevice was ever discovered, and for many years it served as a satisfactory means of sewage disposal for the city. However, the discharge from the city increased in volume on the one hand and the capacity of the sink hole crevice on the other hand was lessened by deposits therein, of the products of erosion and surface wash carried by the sewers, which were and are largely on the combined system.

Termination of Original Method

About fifteen years ago, when at times the sewage could no longer be accommodated by the crevice, at first a little and before long apparently all of even the dry weather flow, quite possibly despite efforts by the city to clean the sink hole by hose flushing or shooting, found its way down to the river, about a thousand feet distant, through an open channel across the lands of the Sherman Lime Company.

Property Rights at Disposal Site

In about 1906 a lawsuit was brought against the city by the Sherman Lime Company which was understood to have been decided in favor of the latter. This suit related to the pollution of the quarry properties of the Sherman Lime Company by the city. The city consequently purchased from the Sherman company the fee ownership of a considerable tract of land embracing the site of the present pond of sewage near the quarry on the

line of the outfall sewer and including all of a wide strip of land between the outlet of the existing sewer and the Hudson river. From this fee ownership there was reserved, however, the right of the Sherman company to quarry some of the lime rock on this property, which right the F. W. Waite Company is said to have secured from the Sherman company. It was especially stipulated that the right to quarry was to be exercised as not to interfere with the Glens Falls sewer system as then or thereafter constructed and maintained.

1918 Outfall Conditions

The conditions resulting in 1918 as the outcome of failing properly to replace this original method of sewage disposal are described in the report of the consulting engineer for the city in that year. This report states that the sewage at that time overflowed the sink hole through an overflow cut in the foundation of the tank building, and dropped over a lime rock channel some 40 feet, then ran through an earth ditch for about one-third of the way to the river, and last flowed rapidly down a steep incline to the latter.

Present General Outfall Conditions

At the time of the inspection the sewage was, as formerly, discharged from a trunk sewer into a large rectangular tank in the bottom of which is the fissure in the rock which at first sufficed to carry away all the sewage but which appears to be so clogged up as to carry away little or none of it. In consequence of this condition the sewage, or the major part of it, flows from the point of discharge from the sewer near the center of the building directly out through the wall in the southeast corner. From here it falls rapidly for a distance of 10 or 20 feet and then runs through a channel with a rocky bed and with more or less precipitous descent into a pond of sewage about 200 feet to 300 feet distant, the overflow from which spreads itself out over the river bank and discharges through open channels, about 200 feet in length, into the river along the shore line.

Area of Impounded Sewage Exposed

This pond seems to be formed from an old quarry bed, and has a width of about 100 feet and a length of about 300 feet. Judging from the depth of other adjacent quarry beds, this pond might be expected to have a depth of from 3 to 6 feet, or a storage capacity approximating 100,000 cubic feet or sufficient for about half a day's storage of the dry weather sewage flow from the entire city. Septic action was observed and bubbles apparently the size of a bucket frequently came to the surface. It is to be borne in mind, however, that since there are no provisions for removing the sludge to drained drying filters, this pond must ultimately become a solid mass of stagnant filth through which the sewer must force a channel.

Outlet from Pond of Sewage

From this pond the sewage overflows through a box culvert under the industrial railroad of the Lime company. The entrance or upper part of this culvert, however, is formed by three 24-inch terracotta pipes, two placed on the lower level, and the third adjoining these but on the adjacent level above. At the time of first observation the two lower pipes were flowing half full at the upper end and about one-third depth at the lower end. A culvert of such design is, of course, in danger of stoppage from quarry brush and debris carried down as well as objects carried by the large trunk sewer. At least one such stoppage is reported to have already occurred and to have been remedied in response to efforts of the health officer.

Sewage Splayed Along the River Bank

Below the discharge of the culvert the sewage spread itself over about an acre of area composed of small pools among the rock fragments lining the river bank, ultimately finding its way into the Hudson. For the time being both the region around the pond and the region around the pools were isolated and free from human habitation though used by workmen. The conditions on

a hot summer day would be objectionable to a far more pronounced degree than could be observed at the time of the inspection which occurred on a cool day after two or more days of rainy weather.

Contemplated Quarrying Operations

At the time of the inspections only two or three men were found working in the Sherman quarry and the representative on the ground as well as the general manager stated that it was not expected to have any men working in the quarry after the 6th of November. It was also stated, however, that some time in the early summer of 1921, if and when business conditions justified, some stripping operations might be begun preliminary to resuming further quarrying, the stripped material to be placed near the sewage pond. This will result in the further increasing of the dike or embankment of dirt now about 150 feet wide and 8 feet or more deep lying between this pond and the present quarry.

Infiltrations into Quarry

In the Sherman quarry infiltration of ground water or sewage occurs in fairly large quantities at three points. At two of these three points the infiltration appears to be of sewage, but no sewage seems to enter the quarry from any other points than these two. The quarry itself is of irregular shape, is about 500 feet long from north to south and has a maximum width at least as great. The three points of infiltration mentioned are on the easterly side of the quarry, which is the side between it and the present sewage outfall ditch and pond. At each of these points the infiltration enters from the foot of the rock wall under three feet or more of rock cover over which is 6 feet or more of earth overburden.

Pollution in Quarry

The first of these infiltration points is about 100 feet below the railroad, or about 100 feet down from the upper or northerly end of the quarry. The amount of infiltration here appeared to be about 1½ second feet at the time of the observation. This first stream of infiltration was clear water without observable odor and apparently contained no sewage. At the next point of infiltration there was a flow of about 0.4 of a second foot of sewage of a dark brown color. This flow entered the quarry at a point about midway down on its easterly side, while about 70 feet below this point the third point of infiltration occurred. There a flow of about 0.3 of a second foot of similar sewage entered. None of this sewage contains large particles but all of it is discolored and malodorous and causes deposits of slime and sludge characteristic of sewage.

Source of Pollution

Neither the city engineer nor the health officer accompanying the engineer from this Department on one of the four inspections were able to say with certainty whether the source of this infiltering sewage was the original sink hole crevice or some other crevice at the point of discharge of the trunk sewer or the pond previously mentioned. There seems to be sufficient fall provided from either source. The pond service appeared to be at an elevation of about 10 feet above the water in the Sherman quarry and about 6 or 8 feet above the points of infiltration discharge of the sewage in the quarry, while the point of discharge of the sewage from the trunk sewer was at an elevation of probably 20 to 40 feet above these points of discharge.

Remedies Proposed

The manager of the quarry appeared decidedly of the opinion that the source of pollution was not the pond but the crevice or rock formation near the sink hole, and he said that he expected, before further working the quarry, to deepen an intercepting rock cut near the point of sewer discharge and between it and the pond and thus cut off this source of contamination, and that he would also further prevent the possibility of pollution

from the pond, if any, by placing the overburden or top soil yet to be removed between the pond and the present quarry.

Possible Temporary Relief

While it was not mentioned in the discussion at Glens Falls, it appears also that it may prove feasible temporarily to relieve the insanitary condition in the quarry by collecting the portion of the sewage which enters it at its points of entry into the quarry workings, and to convey it by an iron pipe across or around the present workings back to the sewage outfall channel above its outlet into the river, provided the authorities were willing to permit this diversion of sewage through private premises until a more permanent remedy be found.

Cause of Entry of Pollution

The fact that the quarry is polluted by sewage is evident, though the precise point at which the pollution leaves the flow between the sewer mouth and the culvert below the pond may seem in doubt. It further appears that the discharge or seepage of sewage into the quarry is largely due to the quarrying of lime rock particularly along the outlet channel of the sewage below the sink hole, and to the changing of the location of the outlet channel of the sewage by the present owners of the quarry.

Changes in Sewage Outfall Channel

It seems from the report of the consulting engineer of the city, submitted with the plans for sewage disposal in 1919, that less than three years ago there was no pond on the sewage outlet channel below the sink hole, and the description of its course further showed that it was on a different course than is the present course of the outfall channel. Inquiry from the manager of the limestone quarry brought out an explanation which appeared to be about as follows: Two changes were made in the channel through which the city sewage flows. These changes seem to have been made by the Lime company in the outfall channel, and in the outfall tank and building and outfall channel of the city, and are understood to be without official knowledge on the part of the city or of the city engineer.

Original Channel and First Change

The outfall channel in 1918 as described in the report of the consulting engineer referred to, ran directly toward the river much as at present for about 300 feet, but then deflected to the right, or in a westerly direction, about 30 degrees or more and passed under the industrial railroad through a culvert now filled in. The present owners of the quarry, who are reported to be successors to the rights of the Sherman Lime Company, appear to have broken out the west side wall of the tank house over the sink hole, into the center of which tank the trunk sewer discharges, and dug an entirely new channel about 600 feet long from the sewer mouth to the industrial railway, largely along the property line between their property and that of the city, and from about 100 feet to 300 feet west of the old channel of the sewage outfall stream.

Second and Last Channel Change

This new channel, however, used the same old culvert under the industrial railway as did the channel from which the sewage was deflected. To reach this culvert the lower end of the channel was considerably curved. To lessen the sewage seepage when subsequent quarrying operations approached this new line, or for other reasons of their own, the Lime company decided to change the channel again. This they appear to have done by filling in the tank at the sink hole sufficiently to divert or otherwise diverting the flow of the stream of sewage back to somewhere near its former channel in the upper half of its course, while the lower half, instead of being deflected as originally about 30 degrees to the west, was deflected to the east toward the new triple pipe outlet and culvert prepared for it and already described.

Bank Protection of Pond Formed

This new culvert opening, however, was at an elevation so much higher than the quarry hole across which the outfall channel was now deflected that the pond already described was formed in the latter. A dam or bank of clay nearly 100 feet thick was placed by a steam shovel close to the pond and between it and the present workings. Besides this protection, there also remains a berm of about another hundred feet of untouched overburden between this bank and the present workings and adjoining the latter.

Probable Course of Infiltration

As the sewage infiltration flows into the quarry through seams in the rock, it seems probable that none of it penetrated these extensive earth banks, but that on the contrary its entire course between either the sewage outfall channel or the pond and its points of discharge into the present workings lies in seams or crevices in the rock which have been cut. These seams may have been all or partly caused or opened by quarrying or blasting operations, as no material change in the sewage channel seems to have been made by the city itself since the settlement of the case at law previously mentioned.

Conclusions

In conclusion I would state that the investigation showed:

1. That local insanitary conditions existed in the Sherman quarry owned and operated by the F. W. Waite Lime Company due to the infiltration of sewage through openings apparently made by quarrying or across territory disturbed by quarrying operations.
2. That general insanitary conditions existed due to the unusual temporary expedient of discharging untreated raw sewage, through open trenches, directly upon the shore line of the river.

Recommendations

In order to abate the nuisance complained of and to correct the foregoing insanitary conditions, it is recommended:

1. That the leakage of sewage from the Glens Falls sewerage system into the Sherman quarry of the F. W. Waite Lime Company be stopped by the parties who caused or permitted the flow reaching such workings, and that such leakage be prevented from reaching any quarry in which men are or are to be employed.
2. That the city of Glens Falls take steps to install the treatment plant provided for by the plans approved by this Department on February 27, 1918, as soon as possible.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *November* 16, 1920

Copies of this report were sent on November 22, 1920, to the Mayor and Common Council of Glens Falls, to the local Board of Health, to the Sanitary Supervisor, and to the F. W. Waite Lime Company.

GREEN ISLAND

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on an investigation of the sewerage conditions of the village of Green Island, Albany county, N. Y., made by Mr. W. C. Emigh, Assistant Engineer in this Department, on August 25, 1920. This investigation was made at the request of Dr. H. L. Albrecht, Health Officer of the village.

Green Island is an incorporated village located at the confluence of the Hudson and Mohawk rivers, about three miles above Albany. It has an estimated population at the present time of 4,800 persons. Its water supply

is furnished by the Green Island Water Company. It is derived principally from infiltration galleries located on Center Island, a small island between Green Island and Troy. The water is purified by gravity mechanical filters. It is stated by the superintendent of the company that the water consumption of the village is approximately 300,000 gallons per day, all of which is metered.

The sewer system of the village, which was installed in the year 1887, was constructed on the combined plan: that is, the flow of sanitary sewage and storm water runoff is collected in the same set of pipes. Four outfalls are provided, located on Bleecker, Swan, Hamilton, and Saratoga streets respectively. The sizes of sewers at these outfalls are 2'6" by 3'9"; 1'10" by 2'9"; 1'8" by 2'6"; and 15" respectively. The first three are egg-shaped brick sewers, and the fourth is a circular tile pipe sewer. In the case of each of the brick sewers, the end of the main sewer is above high tide. A short distance back of each of these open ends is located a manhole, at which point the dry weather flow enters a smaller iron pipe and is conveyed therin; at Bleecker street to a point above normal high tide; at Swan street to a point submerged at low tide; at Hamilton street to a point just above low tide. In 1904 it was estimated that the population served by the Bleecker street sewer was about 15 per cent; the Swan street sewer about 50 per cent; the Hamilton Street sewer 29 per cent; and the Saratoga street sewer about 6 per cent of the total. A 15-inch sewer carrying only storm water discharges into the river at the foot of Center street.

It was stated by the village health officer that complaints regarding only the nuisance created by the Hamilton street sewer had been made to him. It was found that this sewer discharges into a channel of the Hudson river lying between Green Island and Center Island. The recent inspection was made about one hour before extreme low tide. At that time it was estimated that the water level in the portion of the channel into which the Hamilton street sewer discharges was approximately 8 inches above the water level in the main channel. At the southerly end a small amount of water was trickling over the gravel bed of the river in a stream about 2 feet wide. At the northerly end a similar stream was about 4 feet wide. It thus appears that this portion of the river is nearly land-locked for several hours before and after extreme low tide.

A large quantity of gas was rising to the surface in this land-locked portion of the river. It is claimed by residents of the village of Green Island that this condition of stagnation has been either created or aggravated by the use of the north end of the channel lying between Green Island and Center Island as a spoil bank during recent dredging operations in connection with the construction of the State Barge canal. It appears, however, from the gravel observed near the bridge spanning the channel that deposition of gravel and sand is likely to occur in this section and that little current would exist even had the spoil not been dumped at the north end.

The Bleecker and Swan street outfalls are located at points which are at all times connected with the main channel but are in slack water at some distance from that channel. Scum was observed upon the surface of the water near these outfalls. The Saratoga street outfall is located in the face of a bulkhead and at a point fully 2 feet above low tide. Sewage from this outfall falls into slack water. A considerable quantity of scum was noted at this point.

Although it was evident that conditions were somewhat worse at and near the Hamilton street outfall, it also appeared that objectionable conditions existed at all of the outfalls. After careful consideration of these conditions I would recommend —

1. That the village of Green Island prepare and submit to this Department for approval plans showing —

   (a) An intercepting sewer so designed as to receive and convey all of the dry weather flow of the sewers now discharging into the river at Bleecker, Swan, Hamilton, and Saratoga streets to a point suitably located for and adapted to the construction of a sewage disposal plant.

(b) Details of a suitable sewage disposal plant for the preliminary treatment of the dry weather flow of sewage before its discharge into the waters of the Hudson river, together with general plans for the more complete treatment of the sewage of the village.

(c) An outfall sewer to convey the effluent of the disposal plant to a point in the channel of the Hudson river so located as to obtain dilution and velocity of stream flow sufficient to avoid the creation of a nuisance.

(d) Outfall severs to convey the storm overflow from each of the existing outfalls to the main channel of the Hudson river.

2. That after the approval of these plans the village proceed to construct and put in operation the works for the preliminary treatment of the sewage and the intercepting and outfall sewers.

I would further recommend that copies of this report be sent to the Board of Health of the village of Green Island, to the president of the Chamber of Commerce of the village, and to the sanitary supervisor of the district.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *September* 10, 1920 *Chief Engineer*

On September 10, 1920, copies of this report were sent to the sanitary supervisor of the district, to the local board of health, and to the president of the Chamber of Commerce of Green Island.

MALTA (Town)

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report upon an investigation of sewerage conditions and garbage disposal at Round Lake, Saratoga county, N. Y., made on July 20, 1920, by Mr. A. I. Howd, Assistant Engineer in this Department.

Round Lake is an incorporated association in the town of Malta, Saratoga county, N. Y. It is on the main line of the Delaware and Hudson railroad about 13 miles south of Saratoga Springs. During the summer the population of Round Lake is about 1,500, but during the remainder of the year it is only about 500. The village has a comprehensive sewer system, and a water supply owned by the association and derived from a spring brook about 2 miles from the village.

The Round Lake Association, of which Mr. A. A. Lavery is president, and Mr. John T. Wilmot is superintendent, has a board of nine trustees which pass upon all matters pertaining to the association. The association owns about 200 acres of land in the town of Malta, approximately one-half of which is occupied. There are about 300 camps and houses in the settlement practically all of which were occupied at the time of the inspection. The association leases the land for 99 years with privilege of renewal.

The sewer system for Round Lake was designed by Landreth and Fitzgerald and was constructed in 1887. Storm water was discharged into the sewers originally, but about five years ago practically all the storm water was excluded from the sewers. There are about 1.7 miles of sewer mains, ranging in size from 4 inches to 8 inches. The sewage flows by gravity to a sewage disposal plant located in the northeastern part of the village near the lake. This plant which was constructed about 1890 was designed for the treatment of the sewage by chemical precipitation. At present, however, and for some time, the plant has been operated simply as a series of plain settling tanks. The effluent has been discharged into Round lake.

The sewerage conditions in the village are briefly as follows:

1. The area bounded by Prospect avenue on the east, by Whitfield and Lake avenues on the south, by Simpson avenue on the west, and Saratoga avenue on the north, includes the central and major part of the village and is tributary to the main sewage disposal plant.

2. The section enclosed by Merrill, Thomson, Whitfield, and James avenues a low area near the lake, and is served almost entirely by cesspools. Some properties in this section are provided with cesspools.

3. There are some 12 properties on Andrews avenue east of Bowman 'enue which are served by a 4-inch and 6-inch sewer which discharges into series of 3 small settling tanks, located near the ice house. The effluent pe is carried under the Hudson Valley railroad tracks near which the wage discharges into a ditch and flows through underbrush for about 100 200 feet to the lake.

4. That part of the village west of the Delaware and Hudson railroad 'acks is served by cesspools, some of which it was learned have effluent ipes connected to a sewer in Washington avenue which in turn empties ito the ditch along the Delaware and Hudson railroad tracks. There are ome 17 properties in this section provided with cesspools.

5. There are a few houses on Andrews avenue west of Bowman avenue 'hich are too low to be connected with the sewer system and which are rovided with cesspools. A cesspool serving the Weld and Freinsberg roperties was found to be overflowing and creating insanitary and objectionable conditions. The sewage from these properties should be disposed f in a satisfactory and sanitary manner.

6. A cesspool located in Barker Park, near Wiley avenue and Ninth treet, which serves the Boyce and Manson properties on Wiley avenue, 'as found to be practically full of solid matter and scum. This cesspool hould be cleaned out at the earliest possible time and the properties should e connected with the sewer system on Andrews avenue or Lake avenue if ossible.

7. The sewage from the property of a Mr. Boucher, on the corner of Whitield and Ames avenues, discharges onto the ground in the rear of the roperty and flows through a ditch for about 100 feet seeping into the ground. Since there is no sewer to which the property might be connected, it seems that a leaching cesspool should be constructed to receive and dispose of the sewage from the property.

The sewage disposal plant is housed in a frame building about 50 feet square. As previously pointed out, the works were originally operated as a chemical precipitation plant, but for a number of years the plant, with practically no alterations, has been used as a series of plain settling tanks. The first settling tank is constructed of brick, and is about 25 feet by 50 feet by 6 feet deep. This tank is divided into two compartments, 25 feet by 25 feet, by a brick wall through the center of the tank. The sewage enters each compartment through a 10-inch inlet pipe located in the corner of the tank near the division wall and about 2 feet below the top of the tank. About 10 feet from the inlet pipe in each compartment a brick wall extends transversely across the tank to within about 5 feet of the side wall, and about 15 feet from the inlet pipe another wall extends transversely across the tank from the division wall to the side wall. The sewage flows around the end of the first wall and over the second wall from the end of which bricks have been removed allowing the sewage to flow into the outlet chamber. The sewage leaves each compartment through a pipe provided with a gate near the bottom of the compartment and drops into another tank about 25 feet by 50 feet in plan located at elevation about 5 feet lower than the first tank. In this second tank there are two brick walls partially demolished, which were formerly a part of the chemical precipitation plant, but are of practically no use at present. The sewage leaves the tank through a submerged outlet pipe and discharges through about 50 feet of pipe into an open ditch.

This ditch runs in a southeasterly direction for about 100 feet at which point the sewage flows under the tracks of the Hudson Valley railroad, and about 50 feet farther it flows under a state highway. The sewage then flows through an open ditch for several hundred feet into Round lake, at the northwestern end of the lake. No definite information could be obtained as to the volume of daily sewage flow, but it might be roughly estimated at approximately 100,000 gallons daily at the time of the inspection.

The sewage disposal plant is operated as follows: The gate on the influent pipe to one compartment is opened and the effluent pipe on the same compartment is closed, allowing the sewage to fill the compartment. At the same time the gate on the influent pipe to the other compartment is closed and the effluent pipe opened allowing the compartment to be emptied. Each time an effluent pipe is opened a scoop of chloride of lime (about ½ pound) is thrown on to the sewage of the final settling tank. During the summer the tanks are alternated every 6 hours (except during the night) and during the winter every 12 hours.

Rather than operate the settling tanks on the "fill and draw" plan, it would probably be better and more in accordance with modern practice to operate the tanks on the "continuous flow" plan. This would necessitate only a few minor changes such as the removal of about 5 feet of the second transverse brick wall near the division wall in each of the 25 feet by 25 feet tanks, so that all of the sewage might flow around the wall. An outlet pipe should be provided near the top of each tank instead of at the bottom as at present, and scum boards should be provided about 12 inches from the outlets to prevent scum and floating matter from flowing through the effluent pipe.

At the time of the inspection the tanks contained considerable quantities of scum and sludge, which should be removed from the tanks.

Each of the 25 feet by 25 feet tanks has a capacity of about 55,000 gallons, which would provide a detention period for the sewage if operated on the continuous flow plan of about 6½ hours in each tank, assuming a daily flow of sewage of 100,000 gallons during the summer. A detention period for the sewage of about 6 hours would probably be sufficient, and it would be necessary to use only one tank at a time. The secondary settling tank into which the sewage from the two primary tanks is at present discharged might be put out of operation if the primary tanks are operated by continuous flow, since the primary tanks would furnish sufficient detention of the sewage.

The present method of applying the chloride of lime to the sewage is ineffective and insufficient. As pointed out above, a scoop of chloride of lime is thrown into the sewage each time a tank is changed, which results in only a small portion of the sewage being treated. Assuming the daily flow of sewage to be 100,000 gallons and about ½ pound of chloride of lime applied three times a day, the amount of available chlorine applied to the sewage would only be 0.6 parts per million on the average. A suitable apparatus or mixing device should be installed for making a solution from the chloride of lime and the solution should be uniformly applied to the sewage, preferably in the effluent pipe by means of a constant level feed tank or some other satisfactory apparatus. The effluent from the sewage disposal plant should be treated with not less than 10 parts of chlorine per million parts of sewage, which is equivalent to about 25 pounds of chloride of lime per 100,000 gallons of sewage assuming that the chloride of lime contains about 35 per cent of available chlorine.

The effluent from the sewage disposal plant, as pointed out above, is carried in a pipe only a short distance from the plant, the sewage being discharged into an open ditch through which it flows for some distance to the lake. Since the discharge of sewage into the open ditch is objectionable, the effluent pipe should be continued to deep water in the lake.

In regard to garbage disposal, the inspection disclosed the following facts: Garbage is collected 2 or 3 times a week from hotels and boarding houses and once a week from residences. A charge of 25 cents a can is made for the collection of garbage. No attempt is made to separate the garbage from ashes and rubbish. The association has one dump wagon having a capacity of about 1½ yards, which collects about 10 loads or 15 yards of garbage and rubbish per week.

The garbage and rubbish is dumped on one of two dumps located north of the village. One dump is located in an isolated spot near the sewage disposal plant and the other is several hundred feet west of the plant. There was not much garbage exposed around the dumps and no objectionable conditions were apparent at the time of the inspection.

In view of the above facts the following conclusions may be drawn:

1. That in some sections of Round Lake objectionable conditions are created by the improper disposal of sewage from residences.

2. That the present method of operation of the main sewage disposal plant is not in accordance with modern practice.

3. That the present method of applying chloride of lime to the sewage is ineffective and insufficient.

4. That the discharge of the effluent from the sewage disposal plant into the open ditch is objectionable.

I therefore recommend:

1. That the sewage from the Weld and Freinsberg properties be disposed of by some sanitary and satisfactory method; that the cesspool serving the Boyce and Manson properties be cleaned out at once, and that the properties be connected with the sewer system on either Andrews or Lake avenues if possible; and that a proper cesspool be constructed to receive and dispose of the sewage from the Boucher property at Whitfield and Ames avenues, or that the sewage be disposed of by some other satisfactory method.

2. That the Round Lake Association consider the practicability of operating the sewage disposal plant as outlined above.

3. That a suitable apparatus be installed for the application of hypochlorite of lime to the effluent from the sewage disposal plant, and that the effluent be treated with not less than 10 parts of chlorine per million parts of sewage, or about 25 pounds of chloride of lime per 100,000 gallons of sewage (assuming that the chloride of lime contains about 35 per cent available chlorine).

4. That the effluent pipe from the sewage disposal plants be continued to deep water in the lake.

I further recommend that copies of this report be sent to the local Board of Health of the town of Malta, to Dr. James S. Walton, sanitary supervisor of the district, and to the Round Lake Association.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *September* 15, 1920 *Chief Engineer*

Copies of this report were sent on September 16, 1920, to the Round Lake Association and to the local board of health, and the association was urged to carry out the recommendations of the report.

ONEONTA

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on an investigation of the sewerage conditions in the northwestern part of the city of Oneonta, Otsego county, N. Y., made by Mr. W. W. Young on June 3, 1920, in response to a complaint received May 29, 1920.

Oneonta is a thriving city on the Susquehanna river in a farm and milk producing district. It is on the Delaware and Hudson railroad. The yards and shops of this company employ between 800 and 1,200 men, many of whom live in the section under investigation, or closely adjoining in the town of Oneonta. The population of the city of Oneonta is 11,582 according to the census of 1920. The water supply is privately owned and is obtained from a lake some miles distant.

The complainants allege that the health of the entire west end of the city is threatened by the insanitary condition caused by overflowing cesspools, and this Department is asked to cause sewers to be built on the lower outer end of Chestnut street and connecting sewers through Morgan and West End avenues to remedy this condition.

At the time of the inspection there was no odor or surface pollution evident on or from any part of this district nor any insanitary odor noticeable in the neighborhood. It seemed, therefore, that the insanitary conditions were not continuous, and subsequent questioning of the health officer and residents brought out the fact that the conditions arose largely from the rise of ground water due to rainfalls at certain seasons being held by the shelf projecting from the side of a mountain which rises to a height of nearly 500 feet just behind this district.

An examination of the locality and of the successive city and sewerage plans was also made. It appeared that this district was not developed at the time the plans for sewerage and sewage disposal were approved in 1912 and 1916 but that it has since grown into four or five blocks of fairly well built up suburban streets. It was found that all of this western section of the village is either constructed along a single street, Chestnut street, which is mainly brick paved and contains a trolley line, or along short streets branching from Chestnut street. About a quarter of a mile from its western end, Chestnut street rises over a knoll which is about 10 feet higher than the low points beyond, between it and the outer line of the city. However, after rising again a comparatively small amount, it slopes downward toward Ceperly avenue which is in the town of Oneonta about 1,000 feet west of the city line and extends toward the river from distant streets.

To connect the sewers from these newly built up streets into Chestnut street, and to build a sewer along Chestnut street to collect sewage from this district, would cost approximately the same by whatever method might be chosen to provide an outlet connection. In order, however, to conduct this sewage back along Chestnut street to the present sewers through the knoll or high point in the manner requested by the complainants, would require at least 1,000 feet of sewer to be laid where there is already a sewer at a higher level. This new low level sewer would also involve cuts of between 15 and 19 feet deep in most places and necessitate construction along a narrow brick paved street and beside a trolley track.

Another remedy of this situation would be that originally provided by the plans for sewerage approved in 1912. This original 1912 plan provided a sewer about a mile long across private right of way to be acquired by the city. The right of way then contemplated was across railroad property. If this or some other line or right of way acquired by the city be shortened by entering the river at a different point than is planned for the effluent from the city disposal works to enter, either a separate treatment plant must be installed or the sewer should be constructed at such an elevation that it can be connected by gravity to the proposed approved municipal plant when built.

A third remedy or method is to pump the sewage by establishing a low lift pump or pressure chamber and pumping the sewage about a distance of 1,000 feet up over the knoll on Chestnut street with a total lift of about 30 feet. The tributary area is only about 60 acres and it seems to be unnecessary to provide for any additional territory which might become tributary by annexation.

The ground was also examined with the view of the possibility of utilizing a fourth method or remedy to be effected by opening a new street on the low side of Chestnut street and conducting the sewage back along this to the existing sewer beyond the hill or rise on Chestnut street; but the quick descent of the bank and the houses already built on it on the low side of Chestnut street seemed to interfere and make this fourth remedy, or even the construction of a castiron pipe on a right of way along the lower side of Chestnut street impracticable on account of the many interests involved and topography of the ground.

In conclusion, the matter seems largely a local one of sewer extension, and the method of this sewer extension one entirely for local decision. It does not appear essential from the viewpoint of this Department which of these or what other satisfactory method may be adopted of providing sewers for this section; but there does appear to exist a recurrent nuisance which in my opinion can best be permanently remedied by sewer extensions.

I therefore recommend:

1. That the city engineer be authorized to prepare and submit to this Department for approval plans providing for sewers for this district at an early date.
2. That should the city decide not to pump or connect by gravity to the existing sewers but to construct an independent outlet sewer to the river, the sewage collected by such sewer should be passed through and treated in a settling tank, plans for which must be submitted to and receive the approval of this Department.
3. That until such time as sewers are provided in this section of the city, steps be taken by the local board of health, in accordance with the provisions of the Public Health Law, to abate any public nuisance created by the overflow of cesspools in this section.

I would further recommend that copies of this report be sent to the city authorities, to Dr. George W. Augustin, health officer, to Dr. Halsey J. Ball, sanitary supervisor of the district, and to the complainants.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *September* 7, 1920 *Cief Engineer*

On September 13, 1920, copies of this report were sent to the mayor and common council and to the local board of health of the city of Oneonta.

WOODRIDGE

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on an inspection of sewerage conditions in the incorporated village of Woodridge, Sullivan county, made on December 17, 1919, by Mr. C. A. Howland, Assistant Engineer in this Department. This inspection was made in response to a request received from the board of trustees of Woodridge for information in regard to sewerage for the village.

Woodridge is situated in the mountainous region of the central eastern part of Sullivan county, on the main line of the New York, Ontario and Western railroad, about 26 miles northwest of the city of Middletown. In the central part of the village the elevation above mean sea level is about 1,150 feet, while the surrounding mountains rise to elevations of 1,360 and 1,440 feet above mean sea level. The population of the village, which according to the State census of 1915 was 900, increases to several times this number during the summer vacation months. This increase is due to the influx of summer visitors from the large cities, especially New York city. The population during the summer is somewhat indeterminate, but from information furnished the engineer at the time of the inspection the number may be estimated to be from 3,000 to 3,500.

It appears from a map of the village surveyed in 1917 that the corporation is about 1.3 miles in length and 0.64 mile wide, comprising an area of about 0.83 square mile, or nearly 533 acres. The village proper is somewhat long and narrow and lies in the central part of this area. The ground surface of the village slopes toward two watercourses, approximately four-fifths of the village being in the watershed of Sandbury creek, while the western end of the village extends into the watershed of a small tributary of the Neversink river. The number of houses in the village was given as 125, and at the time of the inspection it was noticed that several buildings were in the course of construction, indicating growth in the village. There appears to be only one small manufacturing establishment, the remainder of the buildings being stores, hotels, boarding houses, residences, and similar places.

Woodridge is provided with a public water supply obtained by gravity from a pond about 1½ miles north of the village center. An inspection was made of this water supply by a representative of this Department in the summer of

1918, and in the report upon that inspection it is stated that the number of service taps in the village was 115.

The village of Woodridge is not provided with a public sewer system, and no information was obtained at the time of the inspection which would indicate that private sewers had been constructed in any of the village streets. It appears that in practically all of the buildings which are supplied with the village water modern plumbing fixtures, including flush closets, have been installed. The sewage from these buildings is discharged into cesspools, and in 1 or 2 instances into a small watercourse. The soil conditions in the village are not suitable for the disposal of sewage in cesspools. In parts of the village the top soil is underlain by rock at a depth of from 3 feet to 4 feet, while in other parts of the village the soil is somewhat sandy. The engineer observed, at a place where a large cesspool was in course of construction, that the sand contained a considerable percentage of clay. The soil is therefore somewhat impervious and does not readily absorb the sewage.

The result is that cesspools overflow and new cesspools are continually being constructed in an effort to dispose of the sewage. In the closely built up portions of the village the area available for cesspools is restricted and in some cases has apparently been practically exhausted. A permanent method for the disposal of sewage is therefore not provided by the construction of these cesspools. Conditions of nuisance, which constitute in many cases a menace to the health of the community, result from the overflowing of cesspools. The engineer observed, in one instance, a small watercourse into which several cesspools overflow. A marked odor characteristic of sewage was noticed arising from this stream although the day was very cold. Obstructions in the watercourse cause the sewage to flood an area in the rear of several buildings.

Instances were observed where sewage overflows from cesspools into the road ditches, and a number of cesspools also overflow over the surface of the ground into the railroad cut. These insanitary conditions are general throughout the village, and are becoming more and more acute as the volume of sewage to be cared for increases and the area available for cesspools becomes more restricted. It is apparent that the considerable amounts of money which are being expended for the construction of these cesspools do not provide a permanent method for the disposal of the sewage of the village, and as some of these cesspools are from 10 to 15 feet in diameter and from 6 to 15 feet deep their construction is comparatively costly. The engineer was informed that no serious epidemic of disease which can be traced to the insanitary conditions has occurred in the village. If this is the case it does not argue that such an epidemic may not occur in the future if the existing insanitary conditions are allowed to continue. The occurrence of an epidemic of disease would detract seriously from the reputation of the village as a summer resort.

From the above description it is apparent that the only permanent solution for the present situation in regard to the disposal of sewage in the village of Woodridge is to construct a properly designed system of sewers and sewage disposal. Such a system would provide a permanent relief from the existing conditions, would safeguard the health of the community and prevent the occurrence of conditions of nuisance such as now exist, and would provide for any future growth of the village. The cost of such a system of sewerage and sewage disposal should not prove prohibitive when it is considered that long term bonds, on which the annual per capita payments would be comparatively small, could be issued to provide funds for the construction of such a system.

The procedure for the construction of a sewerage system and sewage disposal in a village is described in sections 260 *et seq.* of article XI of the Village Law. This law requires that plans for sewers shall include all parts of the village, but provision is also made in the law whereby parts of the sewer system which it is unnecessary to construct at the present time in order to care for the sewage of the village may be temporarily omitted from construction, but such omission requires the permission of the State Commissioner of Health. The plans for sewerage and sewage disposal must also

be submitted to the State Commissioner of Health and receive his approval before the system is constructed.

It appears from data gathered at the time of the inspection that the largest part of the village drains naturally toward Sandbury creek. This creek discharges into a large pond just below the village. The engineer was informed that this pond is to be developed for pleasure resort purposes. In such a case it would not be advisable to discharge sewage into the pond, and it would probably therefore be necessary, in the event that the sewage of the village was discharged into this stream, to place the sewer outlet below the outlet of the pond.

The area of the watershed of Sandbury creek at the outlet of the pond is nearly 6 square miles while the watershed area at the inlet of the pond is about 4 square miles. By carrying the sewer outlet below the outlet of the pond the benefit of the greater dilution due to the greater volume of flow in the stream at this point would be obtained. However, an approximation of the minimum dry weather flow to be expected in this stream, from available data from other streams in the State, indicates that the volume of flow in the stream would be inadequate to dispose of the sewage from the maximum population in the village by dilution, and that treatment of the sewage in a disposal plant before it is discharged into this stream would be necessary. There are no records in this Department to show that a public water supply is derived from the Sandbury creek below Woodridge, therefore the question of the pollution of a public water supply does not arise in regard to the use of this stream, but Sandbury creek passes through the village of Mountaindale, about 2½ miles below Woodridge, and it is important that the creation of conditions of nuisance due to the discharge of sewage into this stream be prevented.

The northern end of the village lies within the watershed of a small tributary of the Neversink river. This small tributary has a watershed area of about ¾ square mile above the point at which it crosses a road in the northern end of the village. In order to carry the sewer outlet to the Neversink river, it would be necessary to cover an additional distance of about 1½ miles.

More extensive study than could be made at the time of this inspection is necessary in order to determine the most advantageous system of sewers to be adopted for the village. It would be possible to dispose of the sewage of the small northern area by pumping into the sewer system of the rest of the village if this sewage is discharged into the Sandbury creek, or to dispose of it in a separate sewage disposal plant, the effluent from which might be discharged into the small tributary of the Neversink river. On the other hand, the relative cost of construction and maintenance of a sewage disposal plant to treat the sewage before it is discharged into Sandbury creek, or of a pumping plant to discharge all of the sewage into the Neversink river, including the cost of rights of way to the river, should be considered. Part of the water supply of the village of Port Jervis is taken from the Neversink river at a considerable distance below this point. This supply is chlorinated. The relative costs of the several possible methods should be compared. It will also be necessary to determine the degree of treatment necessary for the sewage before it is discharged into a watercourse. Provision should be made in designing the sewer system and sewage disposal to care for the considerable increase in population during the summer months, and also to provide for a reasonable increase in population in the village in the future.

It is obvious that careful study is necessary in order to design properly the most economical and efficient system of sewers and sewage disposal for the village, and a competent engineer should therefore be employed by the village to undertake this work. The urgent necessity for such a step on the part of the village authorities is apparent from the description of the conditions existing in the village. Furthermore, the village should complete the necessary financial arrangements and should proceed as rapidly as possible with the construction of the system of sewers and sewage disposal. A permanent benefit, protection to the health of the community, and relief from the

existing conditions of nuisance would be obtained at a cost which should not be prohibitive.

In view of the existing conditions in regard to sewage disposal in the village of Woodridge, and after a careful consideration of the local and general requirements in regard to the disposal of sewage from this village, I beg to make the following recommendations:

1. That the village authorities be advised to employ a competent sanitary engineer at once to design a system of sewerage and sewage disposal for the village, plans for which should be submitted to this Department for approval as required by the Village Law.
2. That the village authorities be further advised to construct the system of sewerage and sewage disposal as soon as possible after the plans therefore have been submitted to and have received the approval of this Department.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *January* 17, 1920 *Chief Engineer*

On January 19, 1920, copies of this report were sent to the village president and to the local board of health of Woodridge.

In addition to the above, inspections were made or advice was given through correspondence in matters relating to sewerage and sewage disposal at the following places:

Alfred, Garden City, Gasport, Monroe, Saratoga Springs (State Reservation Baths), Stillwater and Tannersville.

PROTECTION OF PUBLIC WATER SUPPLIES

ENACTMENT AND ENFORCEMENT OF RULES AND REGULATIONS FOR THE PROTECTION OF PUBLIC WATER SUPPLIES

Under section 70 of the Public Health Law the State Department of Health may make rules and regulations for the protection from contamination of any public supply of potable water and its source in the State, and the work of preparing these rules and regulations forms one of the important duties of the Engineering Division of the Department. The rules and regulations are enacted at the request of the authorities in charge of the water supply, made voluntarily or as a result of the recommendations of this Department or requirements by the Conservation Commission. On the receipt of such a request the supply is carefully investigated by a representative of the Engineering Division and the local and general conditions given careful consideration and rules and regulations prepared properly to protect the supply. For the enforcement of such rules and regulations when enacted and published, sections 70, 71, and 73 of the Public Health Law prescribe a definite procedure, the carrying out of which rests largely with the waterworks officials acting in conjunction with this Department and the local health boards.

Of the 540 odd water supplies in the State, 86, not including New York city, are protected by rules and regulations prepared and enacted by this Department. During the year 1920 rules and regulations were enacted for the villages of Monroe and Stamford, and rules and regulations, amending those previously made, were enacted for the village of Peekskill. In addition to these rules and regulations enacted and amended, rules and regulations were prepared for the villages of Canton and Hobart, but have not yet been enacted, and the matter of enacting rules and regulations for Beacon, Rochester, Saratoga Springs, and Wappingers Falls has been under consideration.

The rules and regulations enacted for the protection of the water supplies of Kingston and Watervliet during 1919, and for Albion during 1918, were published, as required by law, in newspapers of the counties in which the districts affected are located, during the year 1920, and proof of such publication furnished to this Department.

MONROE

Rules and regulations for the protection from contamination of the public water supply of the village of Monroe, Orange county, enacted by the New York State Department of Health under chapter 49 of the Laws of 1909, constituting chapter 45 of the Consolidated Laws, as finally amended by chapter 665 of the Laws of 1915 (Public Health Law).

Rules and Regulations

The rules and regulations hereinafter given, duly made and enacted in accordance with the provisions of section 70, 71, 72, and 73 of chapter 45 of the Consolidated Laws (Public Health Law), as heretofore set forth, shall apply to Mombasha Lake and to all watercourses tributary or ultimately discharging into said Mombasha Lake, these bodies of water being part of the public water supply of the village of Monroe, Orange county, New York. The term "lake" wherever used in these rules is intended to mean and refer to Mombasha, which serves as the source of this public water supply. The term "watercourse" wherever used in these rules is intended to mean and include every spring, stream, ditch, gutter, or to other channel of every kind, the waters of which when running whether continuously or occasionally eventually flow or may flow into the public water supply of the village of Monroe.

Wherever a linear distance of a structure or object from the lake or from a watercourse is mentioned in these rules, it is intended to mean the shortest horizontal distance from the nearest point of the structure or object to the highwater mark of the lake or to the edge, margin, or precipitous bank forming the ordinary highwater mark of such watercourse.

Privies Adjacent to Mombasha Lake or Any Watercourse

1. No privy, privy vault, pit, cesspool, or any other receptacle of any kind used for either the temporary storage or the permanent deposit of human excreta shall be constructed, placed, maintained, or allowed to remain within seventy-five (75) feet of Mombasha lake or any watercourse tributary to the public water supply of the village of Monroe.

2. No privy, privy vault, pit, cesspool, or any other receptacle used for the permanent deposit of human excreta shall be constructed, located, placed, maintained, or allowed to remain within two hundred and fifty (250) feet of Mombasha lake or any watercourse tributary to the public water supply of the village of Monroe.

3. No cesspool, pit, or other receptacle of any kind used for the temporary storage of human excreta or sewage shall be constructed, located, maintained, or allowed to remain between the limiting distance prescribed by rule (1) and the limiting distances prescribed by rule (2) unless said cesspool, pit or other receptacle is so arranged and equipped that the said excreta or sewage are at once removed by pump or other satisfactory means through watertight pipes or conduits to some proper place of ultimate disposal, as hereinafter provided; or unless suitable removable vessels or receptacles for the temporary storage of said human excreta or sewage are provided and at all times maintained in an absolutely watertight condition and in such manner as to permit of convenient removal of said excreta or sewage to some place of ultimate disposal as hereinafter set forth.

4. The excreta collected in the aforesaid removable receptacles permitted under rule (3) shall be removed and the receptacles thoroughly cleaned and deodorized as often as may be found necessary to maintain the privy in proper sanitary condition and effectually to prevent any overflow upon the

soil or upon the foundation or floor of the privy. In effecting this removal the utmost care shall be exercised that none of the contents be allowed to escape while being transferred from the privy to the place of disposal hereinafter specified, and that the contents, while being transferred from the privy to the place of disposal, shall be thorougholy covered and that the least possible annoyance and inconvenience be caused to occupants of the premises and the adjacent premises.

5. Unless otherwise specifically ordered or permitted by the State Department of Health, the excreta collected in the aforesaid removal receptacles permitted under rule (3) shall, when removed, be disposed of by burying in trenches or pits at a depth of not less than 18 inches below the surface and at a distance not less then five hundred (500) feet from Mombasha lake or any watercourse tributary to the public water supply of the village of Monroe.

6. Whenever, owing to the character of the soil or of the surface of the ground, or owing to the height or flow of subsoil or surface water, or other special local conditions, it is considered by the State Commissioner of Health that excremental matter from any privy or aforesaid recptacles, or from any trench or place of disposal or the garbage or wastes from any dump, may be washed over the surface or through the soil in an imperfectly purified condition into the lake or any watercourse, then the said privy or receptacles for excreta or the trench or place of disposal or the said garbage or waste dump, shall, after due notice to the owner threof, be removed to such greater distance or to such place as shall be considered safe and proper by the State Commissioner of Health.

Sewage, House Slops, Sink Wastes, etc.

7. No house slops, bath water, sewage, or other excretal matter from any water closet, privy, cesspool, or other source shall be thrown, placed, led, conducted, discharged, or allowed to escape or flow in any manner either directly or indirectly, into Mombasha lake or into any watercourse tributary to the public water supply of the village of Monroe; nor shall any such matters be thrown, placed, led, discharged, or allowed to escape beneath the surface except into watertight receptacles, the contents of which are to be removed as provided by rule (4) within two hundred and fifty (250) feet of the lake or any watercourse tributary to the public water supply of the village of Monroe.

8. No garbage, putrescible matter, kitchen or sink wastes, refuse or waste water, from any creamery, cheese factory, laundry, nor water in which milk cans, utensils, clothing, bedding, carpets, or harness have been washed or rinsed, nor any polluted water or liquid of any kind shall be thrown or discharged directly or indirectly into Mombasha lake or in any watercourse, nor shall any such liquid or solid refuse or waste be thrown, discharged, or allowed to escape or remain upon the surface of the ground or to percolate into or through the ground below the surface in any manner whereby the same may flow into the lake or into any watercourse within a distance of one hundred (100) feet from the lake or any watercourse tributary to the public water supply of the village of Monroe.

9. No clothing, bedding, carpets, harnesses, vehicles, receptacles, utensils, nor anything that pollutes water, shall be washed, rinsed, or placed in Mombasha lake or in any watercourse.

Bathing, Animals, Manure, Compost

10. No person shall be allowed to bathe in Mombasha lake or in any watercourse, nor shall any animals or poultry be allowed to stand, wallow, wade, or swim in the lake nor be washed therein.

11. No stable for cattle or horses, barnyard, hog yard, pig pen, poultry house or yard, hitching place or standing place for horses or other animals, manure pile or compost heap, shall be constructed, placed, maintained, or allowed to remain with its nearest point less than seventy-five (75) feet from Mombasha lake or any watercourse tributary to the public water supply

of the village of Monroe; and none of the above named objects or sources of pollution shall be so constructed, placed, maintained, or allowed to remain where or in such a manner that the drainings, leachings or washings from the same may enter the lake or any such watercourse without first having passed over or through such an extent of soil as to have been properly purified; and in no case shall it be deemed that proper purification has been secured unless the above drainings, or washings shall have percolated over or through the soil in a scattered dissipated form, and not concentrated in perceptible lines of drainage for a distance of not less than seventy-five (75) feet from the lake or any watercourse tributary to the public water supply of the village of Monroe.

12. No human excreta and no compost or other matter containing human excreta shall be thrown, placed, or allowed to escape into Mombasha lake or into any watercourse, nor to be placed, piled, or spread upon the surface of the ground at any point on the watersheds tributary to the public water supply of the village of Monroe, nor shall such human excreta or compost or other matter containing human excreta be dug or buried in the soil at less depth than 18 inches below the surface nor within a distance of two hundred and fifty (250) feet from Mombasha lake or any watercourse tributary to the public water supply of the village of Monroe; and no manure or compost of any kind shall be placed, piled or spread upon the ground within a distance of fifty (50) feet from the lake or watercourse tributary to the public water supply of the village of Monroe.

13. No decayed or fermented fruit or vegetables, cider mill waste, rotten grain or other vegetables refuse of any kind shall be thrown, placed, discharged, or allowed to escape or pass into Mombasha lake or into any watercourse; nor shall they be thrown, placed, piled, maintained, or allowed to remain in such places that the drainage, leachings or washings therefrom may flow by open, blind, or covered drains or channels of any kind into the lake or into any watercourse without first having passed over or through such an extent of soil as properly to have been purified; and in no case shall it be deemed that sufficient purification has been secured unless the above mentioned drainings, leachings, or washings shall have percolated over or through the soil in a scattered, dissipated form, and not concentrated in perceptible lines of drainage, for a distance of not less than fifty (50) feet before entering the lake or any watercourse tributary to the public water supply of the village of Monroe.

Dead Animals, Offal, Manufacturing Wastes, etc.

14. No dead animals, bird, fish, or any part thereof, nor any offal or waste matter of any kind, shall be thrown, placed, discharged, or allowed to escape or to pass into Mombasha lake or into any watercourse. Nor shall any such material or refuse be so located, placed, maintained, or allowed to remain that the drainage, leachings, or washings therefrom may reach the lake or any such watercourse without having first percolated over or through the soil in a scattered dissipated form and not concentrated in perceptible lines of drainage for a distance of two hundred (200) feet from the lake or any watercourse tributary to the public water supply of the village of Monroe.

Fishing, Boating, Ice Cutting, Trespassing, etc.

15. No fishing from boats or through the ice, and no ice cutting, shall be allowed upon the waters of Mombasha lake. No boating of any kind or any trespassing whatever shall be allowed in or upon the waters of said lake except by members of the board of trustees of the village of Monroe or its authorized representatives in the performance of necessary and lawful duties; or by the Sterling Iron Company or its authorized representatives for the purpose of operating gates or other necessary duties in connection with the regulation of the water power derived from said lake; and all such operations shall be carried out in strict accordance with these rules and regulations and under the supervision of the board of trustees of the village of Monroe, and in such manner as will cause no pollution of the lake or the water supply of the village of Monroe derived therefrom.

Labor Camps

16. No temporary camp, tent, building, or other structures for housing laborers engaged on construction work or for other purposes shall be located, placed, or maintained within a distance of five hundred (500) feet from the lake or any watercourse tributary to the public water supply of the village of Monroe.

Cemeteries

17. No interment of a human body shall be made within a distance of three hundred (300) feet from Mombasha lake or from any watercourse tributary to the public water supply of Monroe.

Inspections

18. The board of trustees of the village of Monroe shall make regular and thorough inspections of the lake, streams, and drainage areas tributary thereto for the purpose of ascertaining whether the above rules and regulations are being complied with, and it shall be the duty of said board of trustees to cause copies of any rules and regulations violated to be served upon the person violating the same with notices of such violations, and if such persons served do not immediately comply with the rules and regulations it shall be the further duty of the board of trustees promptly to notify the State Commissioner of Health of such violations. The board of trustees shall report in writing annually on the 1st of January the results of the regular inspections made during the preceding year, stating the number of inspections which have been made, the number of violations found, the number of notices served, and the general condition of the watershed at the time of the last inspection.

Penalty

19. In accordance with section 70 of chapter 45 of the Consolidated Laws (Public Health Law), the penalty for each and every violation of or noncompliance with any of these rules and regulations which relate to a permanent source or act of contamination is hereby fixed at one hundred dollars ($100).

The foregoing rules and regulations for the protection from contamination of the public water supply of the village of Monroe are hereby duly made, ordained, and established on this 9th day of November, 1920, pursuant to chapter 45 of the Consolidated Laws (Public Health Law) of the State of New York, as finally amended by chapter 665 of the Laws of 1915.

M. NICOLL, JR.

ALBANY, N. Y. *Acting State Commissioner of Health*

The required publication of these rules and regulations at least once a week for six consecutive weeks in at least one newspaper in Orange county was not completed during 1920.

PEEKSKILL

Rules and regulations for the protection from contamination of the public water supply of the village of Peekskill, Westchester county, from the Peekskill Hollow creek, enacted by the New York State Department of Health under chapter 49 of the Laws of 1909, constituting chapter 45 of the Consolidated Laws, as finally amended by chapter 665 of the Laws of 1915 (Public Health Law). These rules and regulations supersede those enacted by the New York State

Department of Health for the protection from contamination of the water supply of the village of Peekskill on August 19, 1897, and amended on April 6, 1912.

Rules and Regulations

In accordance with the provisions of the Public Health Law, constituting chapter 45 of the Consolidated Laws, the rules and regulations for the protection of the public water supply of the village of Peekskill enacted on August 19, 1897, and amended on April 6, 1912, are hereby rescinded, and the rules and regulations hereinafter given, duly made and enacted, shall be substituted therefor.

The following rules and regulations shall apply to all natural and artificial reservoirs on the Peekskill Hollow creek and all watercourses tributary thereto or ultimately discharging into said reservoirs, those bodies of water being sources of the public water supply of the village of Peekskill, in Westchester county, New York. The term "reservoir" wherever used in these rules is intended to mean and refer to all storage and impounding reservoirs on the Peekskill Hollow creek which are tributary to or which serve as sources of this public water supply or to any additional reservoir which may be constructed or used for the purpose of this public water supply. The term "watercourse" wherever used in these rules is intended to mean and include every spring, pond (other than the artificial reservoirs and filter basins), stream, ditch, gutter, or other channel of every kind, the waters of which, when running whether continuously or occasionally, eventually flow, or may flow, into the public water supply of the village of Peekskill.

Wherever a linear distance of a structure or object from a reservoir or from a watercourse is mentioned in these rules, it is intended to mean the shortest horizontal distance from the nearest point of the structure or object to the high-water mark of a reservoir, or to the edge, margin, or precipitous bank forming the ordinary high-water mark of such watercourse.

Privies Adjacent to Any Reservoir or Watercourse

1. No privy, privy vault, pit, cesspool, or any other receptacle of any kind used for either the temporary storage or the permanent deposit of human excreta shall be constructed, placed, maintained, or allowed to remain within fifty (50) feet of any reservoir or watercourse at any point within two (2) miles upstream from the intake of the Peekskill waterworks; nor shall any such privy, privy vault, pit, cesspool, or other receptacle for the deposit of human excreta be constructed, placed, located, maintained, or allowed to remain within twenty-five (25) feet of any reservoir or any watercourse at points distant more than two (2) miles upstream from the intake of the Peekskill waterworks.

2. No privy, privy vault, pit, cesspool, or any other receptacle used for the permanent deposit of human excreta, shall be constructed, located, placed, maintained, or allowed to remain within one hundred (100) feet of any reservoir or any watercourse tributary to the public water supply of the village of Peekskill.

3. No cesspool, pit, or other receptacle of any kind used for the temporary storage of human excreta or sewage shall be constructed, located, maintained, or allowed to remain between the limiting distances prescribed by rule (1) and the limiting distances prescribed by rule (2) unless said cesspool, pit, or other receptacle is so arranged and equipped that the said excreta or sewage are at once removed by pump or other satisfactory means through watertight pipes or conduits to some proper place of ultimate disposal, as hereinafter provided, or unless suitable removable vessels or receptacles for the temporary storage of said human excreta and sewage are provided and at all times maintained in an absolutely watertight condition and in such manner as to permit of convenient removal of said excreta or sewage to some place of ultimate disposal as hereinafter set forth.

4. The excreta collected in the aforesaid removable receptacle permitted under rule 3 shall be removed and the receptacles thoroughly cleaned and deodorized as often as may be found necessary to maintain the privy in proper sanitary condition and effectually to prevent any overflow upon the soil or upon the foundations or floor of the privy. In effecting this removal the utmost care shall be exercised that none of the contents be allowed to escape while being transferred from the privy to the place of disposal hereinafter specified, and that the contents, while being transferred from the privy to the place of disposal, shall be thoroughly covered and that the least possible annoyance and inconvenience be caused to occupants of the premises and the adjacent premises.

5. Unless otherwise specially ordered or permitted by the State Department of Health, the excreta collected in the aforesaid temporary receptacles permitted under rule 3 shall, when removed, be disposed of by burying in trenches or pits at a depth of not less than 18 inches below the surface and at a distance not less than five hundred (500) feet from any reservoir or any watercourse tributary to the public water supply of the village of Peekskill.

6. Whenever, owing to the character of the soil or of the surface of the ground, or owing to the height or flow of subsoil or surface water, or other special local conditions, it is considered by the State Commissioner of Health that excremental matter from any privy or aforesaid receptacles, or from any trench or place of disposal, or the garbage or wastes from any dump, may be washed over the surface or through the soil in an imperfectly purified condition into any reservoir or watercourse, then the said privy or receptacles for excreta or the trench or place of disposal of the said garbage or waste dump shall, after due notice to the owner thereof, be removed to such greater distance or to such place as shall be considered safe and proper by the State Commissioner of Health.

Sewage House Slops, Sink Wastes, etc.

7. No house slops, bath water, washings from the bodies of human beings or animals, sewage, or other excretal matter from any water closet, privy, cesspool, or other source, except the purified effluent from a properly constructed sewage disposal plant approved by the State Department of Health, as required by law, shall be thrown, placed, led, conducted, discharged, or allowed to escape or flow in any manner either directly or indirectly into any reservoir or any watercourse tributary to the public water supply of the village of Peekskill; nor shall any such matters be thrown, placed, led, discharged. or allowed to escape or flow onto the surface of the ground or into the ground beneath the surface, except into watertight receptacles the contents of which are to be removed as provided by rule 4, within one hundred (100) feet of any reservoir or any watercourse tributary to the public water supply of the village of Peekskill.

8. No garbage, putrescible matter, kitchen or sink wastes, refuse or waste water, from any creamery, cheese factory, laundry, nor water in which milk cans, utensils, clothing, bedding, carpets or harnesses have been washed, or rinsed, nor any polluted water or liquid of any kind shall be thrown or discharged directly or indirectly into any reservoir or watercourse; nor shall any such liquid or solid refuse or waste be thrown, discharged, or allowed to escape or remain upon the surface of the ground or to percolate into the ground or through the ground below the surface in any manner whereby the same may flow into any reservoir or watercourse within a distance of fifty (50) feet from any reservoir or any watercourse tributary to the public water supply of the village of Peekskill.

9. No clothing, bedding, carpets, harness, vehicle, receptacles, utensils, nor anything that pollutes water, shall be washed, rinsed, or placed in any reservoir or watercourse.

Bathing, Animals, Manure, Compost, etc.

10. No person shall be allowed to bathe in any of the streams, lakes, ponds. or reservoirs tributary to the water supply of the village of Peekskill except in Oscawana lake, Mohegan lake, Osceola lake, Brant lake, Clear

lake, Mud lake, Barger pond, and tributaries thereof; nor shall any person be allowed to bathe in Oscawana lake, Mohegan lake, Osceola lake, Brant lake, and Barger pond within 500 feet of the outlets thereof. No animal or poultry shall be allowed to stand, wallow, wade, or swim in any stream, lake, pond, or reservoir tributary to said water supply, nor allowed to be washed therein. No watering place shall be maintained in such a way as to pollute by muddy leachings or excretal matters any stream tributary to the public water supply of the village of Peekskill.

11. No stable for cattle or horses, barnyard, hogyard, pigpen, poultry house or yard, hitching place or standing place for horses or other animals, manure pile or compost heap, shall be constructed, placed, maintained, or allowed to remain with its nearest point less than one hundred (100) feet of any reservoir, or fifty (50) feet of any watercourse, at any point within two (2) miles upstream from the intake of the Peekskill waterworks; nor shall any such structures or places be constructed, placed, maintained, or allowed to remain within fifty (50) feet of any reservoir or any watercourse at points distant more than two (2) miles upstream from the intake of the Peekskill waterworks; except in the case of islands in Oscawana lake, where no such structures or places shall be constructed, placed, maintained, or allowed to remain within twenty-five (25) feet of the highwater mark in the lake. None of the above named objects or sources of pollution shall be so constructed, placed, maintained, or allowed to remain where or in such a manner that the drainings, leachings, or washings from the same may enter any such reservoir or watercourse without first having been passed over or through such an extent of soil as to have been properly purified, and in no case shall it be deemed that proper purification has been secured unless the above drainage, leachings, or washings shall have percolated over or through the soil in a scattered, dissipated form, and not concentrated in perceptible lines of drainage for distances not less than those specified in the foregoing part of this rule.

12. No human excreta and no compost or other matter containing human excreta shall be thrown, placed, or allowed to escape into any reservoir or watercourse, nor to be placed, piled, or spread upon the ground at any point on any water shed tributary to the public water supply of the village of Peekskill; nor shall human excreta, compost, or other matter containing human excreta be dug or buried in the soil at a less depth than 18 inches below surface nor within a distance of one hundred (100) feet from any reservoir or any watercourse tributary to the public water supply of the village of Peekskill, and no manure or compost of any kind shall be placed, piled or spread upon the ground within a distance of twenty-five (25) feet from any reservoir or any watercourse tributary to the public water supply of the village of Peekskill.

13. No decayed or fermented fruit or vegetables, cider mill wastes, roots, grain or other vegetable refuse of any kind shall be thrown, placed, discharged or allowed to escape or pass into any reservoir or watercourse, nor shall they be thrown, placed, piled, maintained or allowed to remain in such places that the drainage, leachings or washings therefrom may flow by open, blind or covered drains or channels of any kind into any reservoir or watercourse without first having passed over or through such an extent of soil as properly to have been purified; and in no case shall it be deemed that sufficient purification has been secured unless the above mentioned drainage, leachings, or washings shall have percolated over or through the soil in a scattered, dissipated form, and not concentrated in perceptible lines of drainage, for a distance of not less than fifty (50) feet before entering any reservoir or any watercourse tributary to the public water supply of the village of Peekskill.

Dead Animals, Offal, Manufacturing Waste, etc.

14. No dead animals, bird, fish, or any part thereof, nor any offal or waste matter of any kind, shall be thrown, placed, discharged, or allowed to escape or to pass into any reservoir or watercourse. Nor shall any such material or refuse be so located, placed, maintained, or allowed to remain that the

drainage, leachings, or washings therefrom may reach any such reservoir or watercourse without having first percolated over or through the soil in a scattered, dissipated form and not concentrated in perceptible lines of drainage, for a distance of one hundred (100) feet from any reservoir or any watercourse tributary to the public water supply of the village of Peekskill.

Fishing, Boating and Ice Cutting

15. No boating of any kind, nor fishing from boats or through the ice, nor any trespassing whatever, shall be allowed in or upon the waters or ice of any reservoir of the village of Peekskill or of Oscawana lake, Mohegan lake, Osceola lake, Brant lake or Barger pond within 500 feet of the outlets thereof, nor shall any fishing, boating or ice cutting be done in any manner that may pollute the waters of this public water supply.

16. No temporary camp, tent, building, or other structure for housing laborers engaged on construction work or for other purposes shall be located, placed, or maintained within a distance of five hundred (500) feet from any reservoir or watercourse tributary to the public water supply of the village of Peekskill.

Cemeteries

17. No interment of a human body shall be made within a distance of two hundred and fifty (250) feet from any reservoir or from any watercourse tributary to the public water supply of the village of Peekskill.

18. The Board of Water Commissioners of the village of Peekskill shall make regular and thorough inspections of the reservoir, streams and drainage areas tributary thereto for the purpose of ascertaining whether the above rules and regulations are being complied with; and it shall be the duty of said Board of Water Commissioners to cause copies of any rules and regulations violated to be served upon the persons violating the same with notices of such violations; and if such persons served do not immediately comply with the rules and regulations, it shall be the further duty of the Board of Water Commissioners promptly to notify the State Commissioner of Health of such violations. The Board of Water Commissioners shall report in writing annually on the 1st of January, the results of the regular inspections made during the preceding year, stating the number of inspections which have been made, the number of violations found, the number of notices served, and the general condition of the watershed at the time of the last inspection.

Penalty

19. In accordance with section 70 of chapter 45 of the Consolidated Laws (Public Health Law), the penalty for each and every violation of or noncompliance with any of these rules and regulations which relate to a permanent source or act of contamination, is hereby fixed at one hundred ($100) dollars.

The foregoing rules and regulations for the protection from contamination of the public water supply of the village of Peekskill, in Westchester county, are hereby duly made, ordained, and established on this 14th day of September, 1920, pursuant to chapter 45 of the Consolidated Laws (Public Health Law) of the State of New York, as amended by chapter 695 of the Laws of 1911.

M. NICOLL, JR.
Deputy State Commissioner of Health

ALBANY, N. Y.

These rules and regulations were published as required by law once a week for six consecutive weeks in a newspaper of Westchester county and a newspaper of Putnam county, the publication being completed November 13, 1920.

STAMFORD

Rules and regulations for the protection from contamination of the public water supply furnished by the Stamford Water

Company to the village of Stamford, Delaware county, enacted by the New York State Department of Health under chapter 49 of the Laws of 1909, constituting chapter 45 of the Consolidated Laws, as finally amended by chapter 665 of the Laws of 1915 (Public Health Law).

Rules and Regulations

The rules and regulations hereinafter given, duly made and enacted in accordance with the provisions of sections 70, 71, and 73 of chapter 45 of the Consolidated Laws (Public Health Law), as heretofore set forth, shall apply to all natural and artificial reservoirs and to all watercourses tributary thereto or ultimately discharging into said reservoir, these bodies of water being sources of the public water supply furnished by the Stamford Water Company to the village of Stamford, Delaware county, New York. The term "reservoir" wherever used in these rules is intended to mean and refer to all storage and impounding reservoirs which are tributary to or which serve as sources of this public water supply or to any additional reservoir which may be constructed or used for the purpose of this public water supply. The term "watercourse" wherever used in these rules is intended to mean and include every spring, pond (other than the artificial reservoirs and filter basins), stream, ditch, gutter, or other channel of any kind the waters of which when running whether continuously or occasionally eventually flow or may flow into the public water supply of the village of Stamford.

Wherever a linear distance of a structure or object from a reservoir or from a watercourse is mentioned in these rules, it is intended to mean the shortest horizontal distance from the nearest point of the structure or object to the highwater mark of a reservoir, or to the edge, margin, or precipitous bank forming the ordinary highwater mark of such watercourse.

Privies Adjacent to Any Reservoir or Watercourse

1. No privy, privy vault, pit, cesspool, or any other receptacle of any kind used for either the temporary storage or the permanent deposit of human excreta shall be constructed, placed, maintained, or allowed to remain within one hundred (100) feet of any reservoir or within fifty (50) feet of any watercourse tributary to the public water supply of the village of Stamford.

2. No privy, privy vault, pit, cesspool, or any other receptacle used for the permanent deposit of human excreta shall be constructed, located, placed, maintained, or allowed to remain within three hundred (300) feet of any reservoir or within one hundred (100) feet of any watercourse tributary to the public water supply of the village of Stamford.

3. No cesspool, pit, or other receptacle of any kind used for the temporary storage of human excreta or sewage shall be constructed, located, maintained, or allowed to remain between the limiting distances prescribed by rule (1) and the limiting distances prescribed by a rule (2) unless said cesspool, pit, or other receptacle is so arranged and equipped that the said excreta or sewage are at once removed by pump or other satisfactory means through watertight pipes or conduits to some proper place of ultimate disposal as hereinafter provided, or unless suitable removable vessels or receptacles for the temporary storage of said human excreta or sewage are provided and at all times maintained in an absolutely watertight condition and in such manner as to permit of convenient removal of said excreta or sewage to some place of ultimate disposal as hereinafter set forth.

4. The excreta collected in the aforesaid removable receptacles permitted under rule (3) shall be removed and the receptacles throughly cleaned and deodorized as often as may be found necessary to maintain the privy in proper sanitary condition and effectually to prevent any overflow upon the soil or upon the foundation or floor of the privy. In effecting this removal the

utmost care shall be exercised that none of the contents be allowed to escape while being transferred from the privy to the place of disposal hereinafter specified, and that the contents while being transferred from the privy to the place of disposal shall be thoroughly covered and that the least possible annoyance and inconvenience be caused to occupants of the premises and the adjacent premises.

5. Unless otherwise specially ordered or permitted by the State Department of Health, the excreta collected in the aforesaid removable receptacles permitted under rule (3) shall when removed be disposed of by burying in trenches or pits at a depth of not less than 18 inches below the surface and at a distance not less than five hundred (500) feet from any reservoir or watercourse tributary to the public water supply of the village of Stamford.

6. Whenever, owing to the character of the soil or of the surface of the ground, or owing to the height or flow of subsoil or surface water, or other special local conditions it is considered by the State Commissioner of Health that excremental matter from any privy or aforesaid receptacle, or from any trench or place of disposal, or the garbage or wastes from any dump, may be washed over the surface or through the soil in an imperfectly purified condition into any reservoir or watercourse, then the said privy or receptacle for excreta, or the trench or place of disposal, or the said garbage or waste dump, shall after due notice to the owner thereof be removed to such greater distance or to such place as shall be considered safe and proper by the State Commissioner of Health.

Sewage, House Slops, Sink Waste, etc.

7. No house slops, bath water, sewage, or other excretal matter from any water closet, privy, cesspool, or other source shall be thrown, placed, led, conducted, discharged, or allowed to escape or flow in any manner either directly or indirectly into any reservoir or any watercourse tributary to the public water supply of the village of Stamford; nor shall any such matter be thrown, placed, led, discharged or allowed to escape beneath the surface except into watertight receptacles the contents of which are to be removed, as provided by rule (4), within three hundred (300) feet of any reservoir or within one hundred (100) feet of any watercourse tributary to the public water supply of the village of Stamford.

8. No garbage, putrescible matter, kitchen or sink wastes, refuse or waste matter from any creamery, cheese factory, or laundry, nor water in which milk cans, utensils, clothing, bedding, carpets, or harness have been washed or rinsed, nor any polluted water or liquid of any kind shall be thrown or discharged directly or indirectly into any reservoir or watercourse; nor shall any such liquid or solid refuse or waste be thrown, discharged, or allowed to escape or remain upon the surface of the ground or to percolate into or through the ground below the surface in any manner whereby the same may flow into any reservoir or watercourse within a distance of one hundred (100) feet from any reservoir or within fifty (50) feet from any watercourse tributary to the public water supply of the village of Stamford.

9. No clothing, bedding, carpets, harnesses, vehicle, receptacles, utensils, nor anything that pollutes water shall be washed, rinsed, or placed in any reservoir or watercourse.

Bathing, Animals, Manure, Compost, etc.

10. No person shall be allowed to bathe in any reservoir, nor shall any animals or poultry be allowed to stand, wallow, wade, or swim in any reservoir, nor be washed therein. The watering of animals or poultry in any reservoir of the public water supply of the village of Stamford is prohibited. No watering place shall be maintained in such a way as to pollute with muddy leachings or excretal matters any streams tributary to the public water supply of the village of Stamford.

11. No stable for cattle or horses, barnyard, hog yard, pig-pen, poultry house or yard, hitching place or standing place for horses or other animals, manure pile or compost heap, shall be constructed, placed, maintained or

allowed to remain with its nearest point less than one hundred (100) feet from any reservoir or within fifty (50) feet of any watercourse tributary to the public water supply of the village of Stamford; and none of the above named objects or sources of pollution shall be so constructed, placed, maintained, or allowed to remain where or in such a manner that the drainage, leachings or washings from the same may enter any such reservoir or watercourse without first having passed over or through such an extent of soil as to have been properly purified, and in no case shall it be deemed that proper purification has been secured unless the above drainings, leachings, or washings shall have percolated over or through the soil in a scattered, dissipated form, and not concentrated in perceptible lines of drainage, for a distance of not less than one hundred (100) feet from any reservoir or fifty (50) feet from any watercourse tributary to the public water supply of the village of Stamford.

12. No human excreta and no compost or other matter containing human excreta shall be thrown, placed, or allowed to escape into any reservoir or watercourse, nor to be placed, piled, or spread upon the surface of the ground at any point on the watershed tributary to the public water supply of the village of Stamford, nor shall such human excreta or compost or other matter containing human excreta be dug or buried in the soil at a less depth than 18 inches below the surface nor within a distance of three hundred (300) feet from any reservoir nor within one hundred and fifty (150) feet of any watercourse tributary to the public water supply of the village of Stamford; and no manure or compost of any kind shall be placed, piled or spread upon the ground within a distance of one hundred (100) feet from any reservoir or within twenty-five (25) feet from any watercourse tributary to the public water supply of the village of Stamford.

13. No decayed or fermented fruit or vegetables, cider mill wastes, roots, grain or other vegetable refuse of any kind shall be thrown, placed, discharged, or allowed to escape or pass into any reservoir or watercourse, nor shall they be thrown, placed, piled, maintained, or allowed to remain in such places that the drainage, leachings, or washings therefrom may flow by open, blind, or covered drains or channels of any kind into any reservoir or watercourse without first having passed over or through such an extent of soil as to have been properly purified, and in no case shall it be deemed that sufficient purification has been secured unless the above mentioned drainings, leachings, or washings shall have percolated over or through the soil in a scattered, dissipated form, and not concentrated in perceptible lines of drainage, for a distance of not less than seventy-five (75) feet before entering any reservoir or twenty-five (25) feet before entering any watercourse tributary to the public water supply of the village of Stamford.

Dead Animals, Offal, Manufacturing Wastes, etc.

14. No dead animals, bird, fish, or any part thereof, nor any offal or waste matter of any kind, shall be thrown, placed, discharged, or allowed to escape or to pass into any reservoir or watercourse. Nor shall any such material or refuse be so located, placed, maintained, or allowed to remain that the drainage, leachings, or washings therefrom may reach any such reservoir or watercourse without having first percolated over or through the soil in a scattered, dissipated form, and not concentrated in perceptible lines of drainage, for a distance of two hundred (200) feet from any reservoir or seventy-five (75) feet from any watercourse tributary to the public water supply of the village of Stamford.

Fishing, Boating, and Ice Cutting

15. No boating of any kind, fishing from boats, or through the ice, and no ice cutting, or any trespassing whatever shall be allowed in or upon the waters or ice of the reservoirs.

Labor Camps

16. No temporary camp, tent, building, or other structures for housing laborers engaged on construction work or for other purposes shall be located, placed, or maintained within a distance of five hundred (500) feet

from any reservoir or one hundred (100) feet from any watercourse tributary to the public water supply of the village of Stamford.

Cemeteries

17. No interment of a human body shall be made within a distance of three hundred (300) feet from any reservoir or one hundred (100) feet from any watercourse tributary to the public water supply of the village of Stamford.

Inspections

18. The Stamford Water Company shall make regular and thorough inspections of the reservoirs, streams, and drainage areas tributary thereto for the purpose of ascertaining whether the above rules and regulations are being complied with; and it shall be the duty of said Stamford Water Company to cause copies of any rules and regulations violated to be served upon the persons violating the same with notices of such violations; and if such persons served do not immediately comply with the rules and regulations, it shall be the further duty of the Stamford Water Company promptly to notify the State Commissioner of Health of such violations. The Stamford Water Company shall report in writing annually on the 1st day of January the results of the regular inspections made during the preceding year, stating the number of inspections which have been made, the number of violations found, the number of notices served, and the general condition of the watershed at the time of the last inspection.

Penalty

19. In accordance with section 70 of chapter 45 of the Consolidated Laws (Public Health Law), the penalty for each and every violation of or noncompliance with any of these rules and regulations which relate to a permanent source or act of contamination, is hereby fixed at one hundred dollars ($100).

The foregoing rules and regulations for the protection from contamination of the public water supply of the village of Stamford are hereby made, ordained, and established on this 26th day of January, 1920, pursuant to chapter 45 of the Consolidated Laws (Public Health Law) of the State of New York, as finally amended by chapter 665 of the Laws of 1915.

M. NICOLL, JR.
Deputy State Commissioner of Health

ALBANY, N. Y.

These rules and regulations were published once each week for six consecutive weeks in a newspaper in Delaware county as required by the law, and the publication completed April 21, 1920.

INSPECTION OF VIOLATIONS OF RULES FOR THE PROTECTION OF PUBLIC WATER SUPPLIES

During the year 1920 notices issued in accordance with the provisions of section 71 of the Public Health Law were received from the officer or board having by law the management and control of the water supplies of five municipalities regarding violation of the rules and regulations enacted by this Department for the protection from contamination of their water supplies which had not been abated on notices served by the local authorities on the persons violating the same. These violations were immediately investigated by representatives of the Engineering Division, and when actual violations of the rules and regulations were found by the representatives of this Division orders were issued to the local boards of health to abate the violations.

The orders issued were in connection with the water supplies of Elmira, where two violations were found; Kingston, where one violation was found; Olean, where eleven violations were found; Troy, where six violations were found; and Tarrytown, where nine violations were found.

After the orders have been issued to the local boards of health, the matter of abating the violations rests primarily with the local authorities. If a local board of health fails to secure the abatement of the violation within ten days after the receipt of the order, the corporation furnishing the water, or the municipality deriving its water supply from the waters to which the rule or regulation relates, or any person interested in the protection of the purity of the water supply, may maintain an action in a court of record for the recovery of the penalties incurred by such violation and for an injunction restraining him from the continued violation of such rule or regulation.

ANNUAL REPORTS OF LOCAL OFFICERS ON WATER RULE VIOLATIONS

In order to determine to what extent the rules and regulations for the protection from contamination of the different water supplies are being enforced and to be in a position to cooperate with the authorities in securing the abatement of violations, an order was issued by this Department in 1912 requiring an annual report on the 1st of January of each year from the local officer in charge of those water supplies for which rules and regulations had been enacted. All rules and regulations enacted since that date have included a similar requirement. These reports include the results of the inspections of the supplies by the local officials and the results of action taken toward the enforcement of the rules and regulations. In order that the reports of the different municipalities and districts may be uniform, a blank form on which to make the report is mailed to each waterworks official a few weeks prior to the date on which the report is due.

On receipt of these reports from the waterworks officials a careful study of them is made, and in cases where violations are reported the Engineering Division immediately investigates the conditions and the necessary action is taken toward the abatement of the violations.

During 1920 the officers in charge of the following water supplies reported that no violations had been found during the year or that all those found had been abated and that none existed on December 31, 1920.

Albion
Altamont
Amsterdam
Arkport
Bovina Center
Canastota
Cherry Valley
Cobleskill
Cold Spring
Corinth
Cornwall-on-Hudson
Cortland
Coxsackie
Deansboro
Delhi
Dolgeville
Fort Edward
Fredonia
Glens Falls
Hamilton College
Haverstraw
Highland Mills and Central Valley
Hornell
Hudson
Ilion
Kingston
LeRoy
Little Falls
Lyons
Mechanicville
Middleburg
Middletown
Middleville
Monticello
Morris
Newburgh
New Paltz
New Rochelle
North Tarrytown
Norwich
Olean
Oneonta
Ossining
Peekskill

Penn Yan	Saugerties	Warwick
Philmont	Sherburne	Waverly
Port Jervis	Sylvan Beach	Wellsville
Pulaski	Syracuse	West Carthage
Rochester	Syracuse Suburban Water Co.	Westfield
Saranac Lake		Woodridge
Saratoga Springs		

The officers in charge of the following cities report one or more violations existing at the end of the year. In most of these cases the violations have been verified by this Department and orders issued to the local boards of health to abate them. A few which were first reported to this Department in the annual report of the local officers for the year 1920 will be investigated by the Engineering Division during the early part of 1921.

Auburn	Cornell University	Troy
Avon and Geneseo	Mount Vernon	Utica
Elmira Reformatory	Nyack	Yonkers
Gilbertsville	Tarrytown	

No reports were received from the following places, although blank forms were forwarded to them and letters sent later calling the attention of the authorities to the necessity of making an annual report.

Chester	Ithaca	Suffern
Elmira	Perry	Walton

WATER SUPPLIES USED FOR DRINKING AND CULINARY PURPOSES BY COMMON CARRIERS ENGAGED IN INTERSTATE TRAFFIC

Section 13 of the Interstate Quarantine Regulations promulgated by the Treasury Department on January 13, 1916, in accordance with the act of Congress approved February 15, 1893, requires that water provided for drinking or culinary purposes on any car, vessel, or other conveyance while engaged in interstate traffic shall be from a source which is certified and approved as producing water of satisfactory sanitary quality and safety, this certificate to be based on the relative freedom of the water from contamination, or exposure to contamination, as determined through a survey of the sanitary conditions under which the supply is produced and the results of bacteriological and chemical analyses of samples of the water. The certificates may be issued by officers of the United States Public Health Service or the State Department of Health having jurisdiction.

In the case of water supplies in the State of New York, as the result of an arrangement made during the year 1920, the Engineering Division of this Department inspects the supplies once a year if the available force of the Division makes it possible. Samples of the water are collected at the time of the inspection by the engineer making it, and at other times when possible or necessary by representatives of this Department for analysis by the Division of Laboratories and Research. Based on the results of the inspection and the analyses of samples of water, the Engineering Division prepares data sheets showing briefly the condition of the supply and the results of the analyses of the samples of the water. These sheets, together with reports on the inspection of the supply giving in detail its character and condition, are forwarded to the United States Public Health Service as soon as possible after the inspection and analyses have been made. On receipt of this data the United States Public Health Service issues a certificate to the railroad or other carrier permitting, temporarily permitting, or not permitting, the use of the water for drinking or culinary purposes in interstate traffic.

There are, according to the information furnished by the United States Public Health Service and the railroads, 94 different water supplies in the State of New York from which water is taken for drinking and culinary purposes in interstate traffic.

Name	Railroad
Albany	B. & A.; N. Y. C.
Auburn	N. Y. C.; Leh. Val.
Beacon	Central New England
Binghamton	D. & H.; D., L. & W.; Erie
Blossburg	Erie
Buffalo	N. Y. C.; D., L. & W.; Lehigh; Penn: N. Y. C. & St. L.; Wabash
Buffalo Creek	B., R. & P.
Cadosia	N. Y., Ont. & West.
Canandaigua	Penn.
Chatham	B. & A.; N. Y. C.; Rutland
Cherry Valley	D. & H.
Clinton	N. Y., Ont. & West.
Colonie	D. & H.
Cooperstown	D. & H.
Corning	N. Y. C.; Erie
Cortland	Lehigh Valley
Delanson	D. & H.
Delhi	N. Y., Ont. & West.
Dolgeville	N. Y. C.
Deposit	Erie
East Buffalo	D., L. & W.
East Salamanca	B., R. & P.
Edmeston	N. Y., Ont. & West.
Elmira	D., L. & W.; Erie; Penn.
Fulton Chain (see Thendara)	
Grand Central Terminal	N. Y., N. H. & Hart.
Hammondsport	Erie
Herkimer	N. Y. C.
Harlem River	N. Y., N. H. & Hart.
High Bridge	N. Y. C.
Hornell	Erie
Hudson	B. & A.; Uls. & Del.
Hunter	Ulster & Del.
Ithaca	D., L. & W.
Jamestown	Erie
Kaaterskill	Ulster & Del.
Kingston	N. Y. C.; U. & D.; N. Y., Ont. & West
Lake George	D. & H.
Liberty	N. Y., Ont. & West.
Lincoln Park	B., R. & P.
Livingston Manor	N. Y., Ont. & West.
Long Island City	L. I. R. R.; Penn.
Malone	N. Y. C.; Rut.
Middletown	N. Y., Ont. & W.; Erie
Millerton	Cen. New England
Monticello	N. Y., Ont. & West.
Mott Haven	N. Y. C.
Newburgh	Erie; N. Y. C.
New Rochelle	N. Y., N. H. & Hart.
New York City	Erie; N. Y. C.; C. R. R. N. J.; Penn.; N. Y., N. H. & Hart.; Lehigh Val.

Name	Railroad
Niagara Falls (West. N. Y. Water Co.)	N. Y. C.
North Creek	D. & H.
Norwich	N. Y., Ont. & West.
Nunda	Penn.
Ogdensburg	Rutland
Olean	Penn.
Oneida	N. Y., Ont. & West.
Oneonta	D. & H.
Oswego	D., L. & W.; N. Y., Ont. & West.
Peekskill	N. Y. C.
Perry	B., R. & P.
Phoenicia	Ulster & Del.
Plattsburg	D. & H.
Port Chester	N. Y., N. H. & Hart.
Port Jervis	N. Y., Ont. & West.; Erie
Poughkeepsie	Cent. New Eng.; N. Y. C.
Raquette Lake	N. Y. C.
Ravena and Coeymans	N. Y. C.
Rensselaer	B. & A.; N. Y. C.
Richfield Springs	D., L. & W.
Richmond Hill	L. I. R. R.
Rochester	Erie; N. Y. C.; Penn.; B., R. & P.
Roscoe	N. Y., Ont. & West.
Rouses Point	D. & H.
Salamanca	Erie
Saranac Lake	N. Y. C.
Saratoga Springs	B. & M.; D. & H.
Schenectady	D. & H.; N. Y. C.
Schuylerville	B. & M.
Sidney	N. Y., Ont. & West.
Summitville	N. Y., Ont. & West.
Sodus Point	Penn.
Syracuse	D., L. & W.; N. Y. C.
Thendara (Fulton Chain)	N. Y. C.
Ticonderoga	D. & H.
Troy	B. & M.; N. Y. C.
Tupper Lake Junction	N Y. C.
Utica	D. L. & W.; N. Y. C.; N. Y., Ont. & West.; B. & A.
Valley Junction	N. Y., Ont. & West.
Walton	N. Y., Ont. & West.
Warwick	Lehigh & Hudson
Wayland	D., L. & W.
Whitehall	D. & H.

The inspection of these supplies was taken up during the latter part of the year in connection with the regular work of inspections of the water supplies of the State and information regarding 25 supplies furnished to the United States Public Health Service, on the receipt of which certificates were issued to the common carriers using the water from these supplies. The data furnished to the United States Public Health Service in connection with the inspection of these supplies and the character of the certificate issued by the United States Public Health Service are mentioned under the name of the supplies in a section of this report on the investigation of the public water supplies.

INVESTIGATIONS OF PUBLIC WATER SUPPLIES

There are at the present time, so far as is known, 543 public water supplies in the State of New York, the sanitary condition of all of which has been investigated by the Engineering Division of this Department. During 1920, 190 of these water supplies were inspected, either on account of some change or insanitary condition, at the request of the local authorities or voluntarily as a part of the routine work of the Division, inspections of as many supplies being made during the year as is possible with the limited force available. The investigations include a careful inspection, the collection and analyses of samples of the water, and the preparation of reports giving all the essential information relative to the supply and a summary of the results of the investigations, together with recommendations for such improvements as may be deemed necessary or advisable. Copies of these reports are transmitted to the local authorities in charge of the water works, to the local health officer, to the sanitary supervisor of the district, and where the water is used by common carriers engaged in interstate traffic, to the Surgeon-General of the United States Public Health Service.

Samples of water from the supplies are taken in connection with all inspections, but in order to avoid duplication only the results of those which are necessary to an understanding of the conditions are included in the description of the supplies given below. The full analyses may be found in the report of the Division of Laboratories and Research. Where given, the results of the chemical analyses are in parts per million.

AKRON

A reinspection of the public water supply of the village of Akron was made by Mr. Earl Devendorf, assistant engineer in this Department, on September 29, 1920. A previous inspection of this supply was made by the Department in 1916 and the report thereon printed in the Annual Report of the Department for that year.

Akron is an incorporated village of about 1,800 inhabitants located in the northeastern part of Erie county on the West Shore Railroad, about 20 miles east of Buffalo. Nearly all of the inhabitants in the village are supplied with the public water supply. While there are a few private sewers which discharge without purification in the creek, most of the houses are served by cesspools and privies.

The public water supply is derived from a dug well located in the western part of the village. The consumption is said to vary from 300,000 to 400,000

gallons per day. The well consists of a covered basin some 25 feet by 50 feet in plan. It was formerly only 8 feet in depth but the depth has recently increased to 20 feet. The bottom of the well is limestone rock and the sides of the well are constructed of concrete walls. At the time of the inspection there was about 10 feet of water in the well. It is stated, however, that the depth is sometimes as great as 15 feet. The water is said to enter from 2 or 3 fissures in the rock near the bottom. From the well the water is pumped through the distribution system into a steel standpipe 15 feet in diameter and 75 feet high, having a capacity of 100,000 gallons, and located in the eastern part of the village about a mile from the pumping station.

The village proper is higher in elevation than the ground where the well and pumping station are located and the general slope of the village is toward the well. Near the pumping station a privy is located within 50 feet of the well and at an elevation of some 15 feet above the well. There are some 15 people living within 100 feet of the well and approximately 200 within 1,000 feet of the well. The village is located in a limestone region and the depth of soil covering is relatively shallow. Since there are numerous fissures to be found in all limestone regions, it is apparent that pollution from the cesspools and privies from practically the whole of the village may find its way into the ground water supply of the well used as a source of public water supply. The engineer was informed that under certain storm conditions the water in the well is quite turbid, indicating that the water under such conditions receives little if any natural purification by filtration through the soil. Under such conditions it is very apparent that the supply cannot be considered entirely safe, even with the present method of sterilization by means of liquid chlorine, since the rate of application is not varied with the character of the water being pumped.

The results of the bacteriological examination of samples of the chlorinated supply taken at the time of the inspection show high total counts probably the results of multiplication of various forms of water bacteria due to the delay in transit. Organisms of the B. coli type were present in all of the 10 c.c. and one of the 1 c.c. inoculations examined, indicating that the amount of chlorine being applied to the water was not sufficient for the effective sterilization of the public water supply.

As a result of the inspection it was concluded that the well from which the public water supply of the village of Akron is derived is unsatisfactorily located, due to the fact that the ground water sources are subject to pollution from practically the entire village population and receive little natural purification by passing through the soil; that due to the excessive hardness of the water the supply is not satisfactory for laundry or commercial purposes; and that the chlorination apparatus is not being operated in such a manner as effectively to sterilize the public water supply at the time the samples were collected.

It was therefore recommended that the village authorities in charge of the public water supply secure the services of a competent water supply expert to make a study of the possible sources of water supply and the treatment of the present supply, and advise them as to the best method of securing a satisfactory supply; and that until such a satisfactory supply is obtained the present supply be effectively sterilized by means of liquid chlorine, and that to accomplish this the present rate of application of chlorine be increased and regulated in accordance with the result of frequent tests for for excess chlorine and such bacterial examinations as may be made from time to time.

ALBANY

The public water supply of the city of Albany was investigated by Mr. Theodore Horton, chief engineer in this Department, and Mr. E. S. Chase, assistant engineer, during March, 1920. A special investigation of the water supply was also made by Mr. Horton in connection with the outbreak of colitis in the city of Albany during the latter part of February, 1920. The complete reports on both of these investigations follow.

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

In accordance with your request I beg to submit the following report with reference to the recent outbreak of colitis in the city of Albany, of my inquiry into it with reference to the public water supply, and of the advice given the city in order to correct the trouble.

My first information regarding any prevalence of colitis in the city was on or about February 26, just before I was leaving for New York city on a special investigation, when through indirect channels I had learned of a number of persons who had been affected with this malady. Before leaving the city, however, I called up Mr. George E. Willcomb, chief chemist in charge of the filter plant, and upon inquiry learned that he also had indirectly heard of similar cases. At this time, owing largely to the fact that colitis is not a reportable disease, neither Mr. Willcomb nor the writer had received officially or indirectly any definite knowledge as to the exact nature and prevalence of the malady or as to its probable or alleged source. Upon inquiry into the operation of the filter plant, I learned, however, that the plant was then being run as it had been for a considerable period of time, and as has been customary at certain seasons, without the use of alum as a coagulant. The water at this season of the year usually carries an excess of organic matter, with low turbidity, and owing to the diminished efficiency of filtration in the absence of coagulation due to these extremes it has been necessary to apply chlorine in corresponding additional amounts in order to obtain a water of safe bacteriological quality.

It should be particularly borne in mind that up to this time there had been presented no specific evidence indicating that the water supply was primarily or indirectly the cause of the colitis. On the contrary, there seemed to be a general grippe or intestinal flu. From a hasty review of what facts I was able to obtain, it was at once clear to me that the trouble might be due to the water supply. I explained this to Mr. Willcomb and called his attention to the fact that elsewhere in the State under similar conditions, as in the case of Green Island recently, the water supply had been found to be responsible for colitis, notwithstanding the fact that the bacterial quality of the water had been within acceptable analytical standards; and that in my judgment, and notwithstanding that other causes had been assigned, the real cause of this outbreak of colitis was to be found in either the physical or the sanitary quality of the water. I therefore inquired whether it would not be possible to resume alum treatment as a precautionary measure and irrespective of the question of what the real cause of the trouble might be.

It was explained to me, however, that only a limited amount of alum was on hand, due to delayed shipment of this material resulting from the serious congestion of the railroads and embargoes of freight material. With only a limited supply of alum on hand, and the certainty of flood conditions in the river at an early date, at which time the use of alum would be imperative, the situation was obviously one of serious moment, and Mr. Willcomb hesitated acting immediately upon my recommendation, at least until more definite information was presented that the trouble was water-borne. I was assured, however, that the matter of resuming the application of alum in the coagulation basin would be taken up at once and efforts made to hasten alum shipments which had been ordered.

On Tuesday, March 2, upon my return from New York, I again communicated with Mr. Willcomb and inquired into the situation with reference to any further spread of colitis in the city, as to the results of his endeavors to hasten shipments of alum, and as to the condition of the water generally. I was advised that no trace of the shipments of alum had been obtained, although efforts were being continued to trace them; that further and more definite information had been received concerning the presence of colitis in the city; that he was experiencing some difficulty in keeping the bacterial quality of the water up to a satisfactory standard owing to the excess of organic matter and low turbidity; and that a considerable excess of chlorine was still being constantly applied in an effort to keep the bacterial quality within satisfactory limits. Mr. Willcomb stated, however, that there was

still no definite or convincing evidence that the colitis was due to the water, and that opinions were still held among physicians that the colitis was attributable to other causes and not to the water supply.

The matter was discussed quite at length with Mr. Willcomb on this occasion, when I pointed out that the situation, epidemiologically, was very characteristic, was analogous to what has occurred in other municipalities having waters of a similar character, and although there was little probability that typhoid fever in any appreciable amount would follow, the physical condition alone of the water, with its excessive organic matter and excess of chlorine, and irrespective of its bacteriological quality, was in my judgment such as to readily account for the colitis. It was also obvious to me that the only logical thing to do was to resume alum treatment at once, which would readily prove whether or not the condition of the water was the source of the colitis, and in the meantime remove the cause of the trouble if due to the water supply. With reference to the limited supply of alum on hand, and the possibility of a shortage due to flood conditions, I figured from the information given me that there was ample supply on hand to justify the immediate use of alum for at least a limited period, during which time every effort could be made to locate and have delivered the shipments of alum which had been ordered.

Following this interview with Mr. Willcomb, and another one later with Mr. Greenalch, Commissioner of Public Works, concerning the situation, it was decided on March 5 to resume the application of alum. Since then the situation has apparently cleared up, and so far as it has been possible for us to obtain the information through inquiries made of physicians in the city (this disease not being reportable), only a few, if any, new cases of colitis have occurred subsequent to March 5, the date of resumption of alum treatment. At the same time, the organic matter in the water furnished has been largely eliminated, the amount of chlorine necessary for proper sterilization greatly reduced, and the bacterial quality of the water greatly improved. No cases of typhoid fever have as yet been reported, and although it may be too early to make any definite statement in this regard, there is certainly little evidence to indicate that any undue prevalence of this disease will occur.

In conclusion, I would state that the evidence presented in connection with this outbreak of colitis demonstrates clearly that the water supply was the causative and responsible factor; and that it is obvious, if similar outbreaks are to be avoided in the future, that the city should adopt continuously and uninterruptedly the alum treatment in the operation of its filtration plant, and that satisfactory provision should be made with reference to storage and shipments of alum to insure that an adequate supply of this chemical be always on hand.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *March* 12, 1920

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report upon the public water supply of the City of Albany, based upon an investigation made by the writer and Assistant Engineer, E. S. Chase, during March of the present year.

Albany, the capital of the State, is situated on the right bank of the Hudson river some 150 miles above its mouth and a short distance below the head of navigation. With a population according to the recent census of 114,000, it comprises, with other nearby municipalities, an urban district of approximately one-quarter million people. It is an important railroad center, with lines of the New York Central, Boston and Albany, Boston and Maine, Delaware and Hudson, and West Shore railroads making connections with the principal centers of population in northeastern United States. River transportation, both passenger and freight, is provided by the Hudson Navigation

Company and by the Hudson River Day Line. A comprehensive system of sewers on a combined plan carries domestic and storm water sewage to a disposal plant located on Westerlo Island, south of the city, consisting of grit chamber, pumping station, and Imhoff tanks.

The public water supply is owned by the city and operated under the direction of Wallace Greenalch, Commissioner of Public Works. The principal source of supply, representing about 85 per cent of the total, is obtained from the Hudson river, the intake being located about 2 miles north of the center of the city. This supply is obtained from the Hudson river, and is subjected to filtration and chlorination and thence pumped into the distribution system. A second source of supply is obtained from Rensselaer lake, an artificial body of water located some few miles west of the city, the water from which, unpurified, is led through a pipe line to Bleecker reservoir, situated in the city just east of Swinburne park, from which it is distributed by gravity into the present city mains. A third source of supply is obtained from Patroons and Sands creek in the northwestern part of the city, which, partially purified, is distributed by gravity to the West Albany railroad shops of the New York Central railroad. A fourth and comparatively small source of supply is derived from Maeslandt kill, a small stream lying north of the city, which, unpurified, serves a few houses on North street and the filtration plant.

History and Development of Supplies

The public water supply of Albany was originally developed by the Albany Water Works Company which operated the system between the years 1802 and 1851. This original supply was obtained by gravity from the two small upland streams, Patroons creek and Maeslandt kill, lying a short distance north of the city. The first distribution system consisted of bored wooden logs, one of the oldest types of water mains used in the country. Later, iron pipes, cast in two and three-foot lengths, were used to some extent. In the earlier days the water was led through pipe lines to the city and stored in cisterns constructed beneath the streets, but in 1811 a distributing reservoir was built at the corner of Eagle and Columbia streets, the site of the present county building.

In 1851 the waterworks were purchased by the city and the original sources of supply continued in use. In 1852 the Rensselaer Lake and Bleecker reservoirs, with connecting conduit, were constructed. These upland supplies served the city exclusively until 1873. During this interval, however, numerous complaints were made of the objectionable tastes and odors in the water, and at times regarding its insufficiency. It therefore became necessary to provide an increased supply, and after consideration of a number of possible sources suggested by different engineers and sanitarians it was finally decided to adopt the Hudson river as a source of increased supply. This decision brought about the construction in 1873 of a pumping station and an intake in the Hudson river at the foot of Quackenbush street. The river water obtained through the new intake was at first pumped directly into the Bleecker reservoir. Later, in 1876, Prospect reservoir was constructed to provide a high service supply, the water being pumped from the Bleecker reservoir into the Prospect reservoir.

Soon after the Hudson river supply was introduced into the city in 1873, the question of its sanitary quality arose. Complaints still continued regarding tastes and odors, and its purity from the standpoint of health frequently arose. Furthermore, the growth of the city and the water consumption had increased materially, and necessity for additional relief reached a climax in 1884 and 1885. During the latter year a special water commission was created to inquire into available sources for a pure supply for the city, and if they deemed the present supply the most available, then as to what method, if any, could be adopted for purification. This commission recommended in 1885, and the common council of the city approved, a contract for the construction of a system of wells by W. P. Andrews Bros. These wells were to be located either on the sand plains west of the city or on the river flats along the Hudson. In an attempt to fulfill this con-

tract, some 390 tubular wells were sunk near the Hudson in the lowlands immediately north of the present filtration plant. A yield of some 6,000,000 gallons daily was claimed for these wells, but the test called for in the contract was apparently never carried out and the wells were not accepted by the city. The exact reason why these wells were abandoned or were not accepted is not clear, but it appears probable that it was due to either questionable yield or unsatisfactory quality of the water, or both.

In addition to this proposed well supply, the special water supply commission also investigated and reported upon the possibility of securing a supply from two other sources, namely, the Normanskill at French's Mills, some 11 miles west of the city; and Kinderhook creek on the east side of the Hudson, some 15 miles from the city. Neither of these projects, however, was adopted by the city although both were favorably reported upon by prominent consulting engineers, the former by Rudolph Hering and John Bogart, and the latter by Frederick P. Stearns and Clemens Herschel.

Although the city did not adopt any of the plans for a new supply, it did however in 1888 abandon the original intake on the Patroons creek supply situated below the West Albany railroad shops, and constructed a new distribution reservoir known as the Tivoli reservoir, situated on higher ground in the vicinity of the old intake, this reservoir receiving water through pipe lines from two other reservoirs constructed at the same time, one on Patroons creek just above Russell road and the other on Sands creek just above the same road. Later, in 1895, the city also constructed a new pipe line from the Quackenbush pumping station to the Prospect reservoir, and abandoned the Prospect pumping station. These improvements, while affording relief principally in regard to increased capacity, did not afford relief so far as the quality of the Hudson river supply was concerned.

The city continued to suffer from an excessive death rate from typhoid fever as a result of impure quality of the Hudson river supply, and in 1897 another prominent consulting engineer, Allen Hazen, was retained to investigate and report upon the feasibility of filtering the Hudson river. Mr. Hazen's report recommended the installation of slow sand filters for the purification of Hudson river water. This recommendation was adopted although considerable opposition had developed in favor of the installation of rapid sand filters. Construction work on the new filtration plant was begun in 1898. This plant comprised a new intake located about two miles north of the city, a sedimentation basin, slow sand filters, clear water basin, and a four-foot pure water conduit leading from the purification plant to the Quackenbush pumping station. The works were completed and first put in continuous operation on September 6, 1899.

A few years later it became necessary to increase the capacity of the filtration plant and to provide improved facilities for caring for the increased water consumption, and for meeting difficulties of operating filters of the slow sand type. Accordingly, in 1907, a new intake was constructed at the filter plant by extending the old intake out into the main channel of the Hudson river, and in 1908 the present preliminary filters were completed and first put into service. Sterilization of the supply with hypochlorite of lime was first introduced in 1909, and in 1916 this treatment was supplemented by sterilization with liquid chlorine. In 1910 the Tivoli distribution reservoir was abandoned, and with the exception of a short period in 1917 has not since been used.

Detailed Description of Waterworks

(a) Hudson River System:

Distribution System, High and Low Service: The present distribution system consists of about 165 miles of castiron water mains ranging in size from 3 to 36-inches in diameter. There are two independent service systems, the high service which is connected with the Prospect reservoir, and the low service connected with the Bleecker reservoir. The boundary between the two systems runs approximately north and south along Swan street. The average daily water consumption at the present time is about 24,000,000

gallons, of which 1,500,000 gallons are obtained from Rensselaer lake supply through the Bleecker reservoir and the low service system. Approximately 2,000,000 gallons a day additional is obtained from the old Sands creek and Patroons creek supplies and delivered to the West Albany shops of the New York Central railroad. The Maeslandt kill supply serves independently only a few houses and the filtration plant. There are approximately 18,000 service taps, of which about 46 per cent are metered.

Pumping Stations: The pumping station at the purification plant is a substantial brick and concrete structure. This station contains seven steam driven centrifugal pumps, as follows: One 16,000,000-gallon raw water pump; two 14,000,00-gallon raw water pumps; two 30,000,000-gallon settled water pumps; and two 10,000,000-gallon wash water pumps. A 1,500,000-gallon direct acting pump is used for washing and conveying filter sand. The raw and settled water pumps are driven by vertical compound condensing engines, while the wash water pumps are driven by vertical double simple engines. Steam is furnished by three 250-h. p. water tube boilers.

The main pumping station at Quackenbush street contains five vertical triple expansion fly-wheel pumping engines, three of 5,000,000 gallons and two of 10,000,000 gallons daily capacity. The piping arrangement permits the pumping of water independently into either high or low services. Steam is furnished by four 300-horsepower water tube boilers.

Prospect and Bleecker Reservoirs: The water from the main pumping station is pumped independently into the two distribution service systems connected with the two reservoirs, Prospect and Bleecker, against the pressure maintained by each reservoir. Both reservoirs are of masonry construction surrounded by earthen embankments and uncovered. The Prospect reservoir has a capacity of 7,300,000 gallons and the Bleecker reservoir a capacity of 32,000,000 gallons. The Prospect reservoir, which is connected with the high service system, receives filtered river water only, while the Bleecker reservoir receives a mixture of unpurified Rensselaer lake water and filtered river water.

Hudson River Intake: The intake from the Hudson is located at the Government dike on the west bank of the main channel of the river. This intake consists of a monolithic concrete structure with four vertical inlet ports 4 by 6 feet in area and protected by iron bars placed 8 inches center to center. After passing through the inlet ports the water flows through stilling devices into a concrete conduit 5 feet in diameter and 1,035 feet in length discharging into the pump well of the low-lift pumps at the pumping station. The invert on this conduit is 8 feet below mean low water.

Sedimentation Basin: From the suction well the raw water is pumped against a head of about 18 feet into the sedimentation basin. This basin is 383 by 600 feet in area by 9 feet in depth and has a capacity of 14,600,000 gallons. The raw water enters the basin at the southeast corner, and the effluent flows through an outlet at the northwest corner to pumps which discharge upon the preliminary filters. No baffles are provided in this basin so that its full detention capacity is not utilized, the actual detention period being estimated at about 12 hours. The cleaning of the basin occurs every year or two, and is accomplished by draining off the water and flushing the deposited solids through a mud pipe the entrance to which is located near the middle of the basin. Hydrants are located around the perimeter of the basin for this purpose.

Chemical Mixing Devices: At certain periods of the year, particularly during flood conditions, alum is applied to the raw water before it passes to the sedimentation basin by means of injectors placed at the discharge end cf the raw water pumps. The alum is mixed in a dissolving tank in which the temperature is raised by steam to nearly boiling. From this dissolving tank the alum solution is run into two 5,000 gallon solution tanks and the solution made up to a strength of approximately 8 per cent. Mixing is accomplished by means of air agitation. From these tanks the alum solution flows by gravity through a constant level orifice box and thence to a line leading to the raw water pumps. The alum is applied in amounts ranging from 1 to 3 grains per gallon, depending upon the turbidity and organic

constituents in the raw water. The minimum amount is applied immediately after floods in the river, and the maximum in the late summer when the organic content of the river water is at its highest. The dose to be applied is determined by bottle tests.

Preliminary Filters: After sedimentation the water is pumped upon the preliminary filters, which are sixteen in number. These filters consist of concrete tanks having an area of 810 square feet each, or a total area of about 0.3 acres. A continuous concrete roof covers all these filters and an operating gallery extends along the front. The sand bed is 30 inches in depth and overlies 18 inches of gravel. The effective size of the sand is 1.5 millimeters, and the uniformity coefficient is 3.0. The gravel layers range in size from 3 inches to ⅛ inch. The strainers are vertical brass tubes extending about 4 inches above the floor, and in each of these tubes near its top are eight ⅛-inch holes. These strainers are spaced 9 inches center to center, and there are 1780 in each bed. The strainers are connected with a collecting system of concrete pipe which leads into the main effluent channel, 24 inches in diameter, which in turn leads into a float well and control chamber. The filtered water flows from this control chamber over a weir into a conduit leading to the slow sand filters.

The preliminary filters are ordinarily operated at a rate of 70,000,000 gallons per acre per day. The filter runs average about 30 hours, but at times may be as small as 8 hours only. The filters are washed by reverse flow in the usual manner, the amount of wash water approximating 3 per cent of the total amount of water filtered. About once every two years the sand in the filters is removed, washed in Nichols sand-washers, and replaced. The water level over the filtered sand is maintained at a depth of about 3 feet by regulating the discharge of the pumps upon the beds. The wash water troughs are of concrete, 2 feet wide with 4-inch sides, and are approximately 12 inches above the top of the sand. During washing the vertical rise of the wash water is 1.3 feet per minute. The filters are washed until the wash water runs fairly clear. No water is filtered to waste after washing. The valves are hydraulically operated. The rate controller of each filter consists of a valve operated by a float in the control chamber and may be adjusted by changing the position of the float upon the spindle leading from the valve.

Slow Sand or Secondary Filters: The slow sand, or secondary filters, are eight in number, each 0.7 acres in area, thus giving a total filtering area of 5.6 acres. The filter basins are constructed of concrete and brick and covered by vaulted concrete roofs over which two feet of earth and sod is placed to protect the filters from freezing. The sand in the filters has a maximum depth of 4 feet over about 12 inches of graded gravel. The sand has an effective size of 0.32 millimeters, and a uniformity coefficient of 2.0. The gravel ranges from ¾ of an inch to ⅛-inch material. The sand was originally obtained by dredging from the river. The effluent from the preliminary filters enters each bed at one corner through a baffled control well in which are placed 20-inch gate valves, operated by hand. An attempt to secure automatic control was made by the installation of float valves, but in the case of only one of the filters have these valves proved successful. The underdrains consist of 6-inch tile pipe laid with open joints, which discharge into a 30-inch main drain of vitrified tile surrounded by concrete. From the main drain the clear water flows through outlet wells in which are calibrated submerged orifices through which the rate of flow is measured by means of float operated indicators. The normal depth to which water is carried over the filter sand is 5.5 feet, and the average rate of operation of the filters is about 2,500,000 gallons per acre per day. When the loss of head reaches about 4 feet the filters are cleaned by scraping off about 1 inch of the top layer of sand and ejecting it outside of the filters. The average length of run between the scrapings is about 60 days. The sand is removed from the filters until a minimum thickness of sand of about 24 inches remains. The dirty sand removed from the filters is then washed in a Nichols' sand-washing machine and ejected back upon the bed. The entire

sand of the filters is replaced about once every eight years. After scraping, a filter is refilled by the effluent of the adjacent bed and is then run for a while at a low rate of filtration.

In 1914 it became impossible to pass all the effluent of the primary filters through the secondary filters owing to the heavy draft upon the supply and to the clogged condition of the filter beds. At this time by-passes were constructed from the top of the last two sand filters in order to divert primary effluent into the clear water basin. Since that year it has been customary to by-pass varying amounts of primary effluent into the clear water basin in amounts ranging from nothing in April, May, and June, to 60 per cent at such times of the year as the high organic matter in the river water renders operation of the slow sand filters difficult.

Sterilization Plants: Sterilization of the filter effluents is provided as they enter the clear water basin. Two types of apparatus are employed, the original hypochlorite plant being used at times, and at other times the more recently installed liquid chlorine apparatus. Whichever apparatus is in use, the other is always held in readiness for emergency.

The hypochlorite plant consists of a 4-foot by 4-foot circular iron tank in which the bleach is first mixed and screened. From this tank the concentrated solution is drawn into two circular concrete tanks 21 by 4 feet deep and made up to the requisite strength. From these tanks the solution is withdrawn from the top by means of a flowing orifice. This orifice is connected by means of a glass tube with flexible joints to a 2-gallon Wolff bottle in which the air is compressed in direct proportion to the head of solution in the tanks. A special vulcanized valve on the feed tank of the Wolff bottle provides a means of regulating the pressure of air in the bottle which is shown by a small manometer tube of mercury. In the neck of the bottle is a collar in which vulcanized orifices of various sizes may be inserted in order that the rate of application may be varied as desired.

The liquid chlorine equipment consists of three manual control manometer type solution feed apparatuses manufactured by the Wallace and Tiernan Company. Twelve 150-lb. chlorine cylinders are attached to each apparatus, these cylinders being placed on large platform scales in order that the readings of the apparatus may be checked by actual weighing.

In the case of the hypochlorite solution, its actual strength is determined by analyses and the strictest control over its application. For several months past it has been the practice to maintain an excess of chlorine in the treated water ranging from 0.01 to 0.15 p.p.m. by weight as determined by the orthotolidin method. The chlorine solution is applied in the clear well at such a point as permits the thorough mixing of the chlorine solution with the filter effluent. The amount of chlorine applied varies from about 0.2 to 1.5 p.p.m., depending upon the amount of organic matter present in the water.

Clear Water Basin and Conduit: The clear water basin is 94 feet square, with a capacity of 600,000 gallons, and is covered by a concrete roof. From this basin a 4-foot steel conduit, certain sections of which are surrounded by concrete, extends for 7,913 feet to the Quackenbush pumping station. This conduit is laid for a considerable portion of its length in the bed of the old Erie canal. It has only a comparatively shallow covering of from 2 to 5 feet, and flowing substantially by gravity is under practically no head or pressure. This line has been in service for some twenty years, and an inspection made some seven or eight years ago indicated that considerable deterioration had taken place which, of course, has since increased.

(b) Rensselaer Lake Supply:

Rensselaer Lake, from which the upland supply is obtained, is formed by an earthen and masonry dam across the course of a small stream a short distance west of the city. The watershed tributary to this reservoir is but 2.75 square miles in area and at certain times of the year the supply in the reservoir is depleted. The water from this source, however, is used almost constantly throughout the year, yielding on the average about 1,500,000 gallons per day.

The watershed is a sparsely inhabited sandy plain covered with growths of scrub timber. There are only five or six houses on this area, and consequently opportunities for serious pollution from a resident population are not numerous although there is ever present the possibility or chance of wilful pollution from visitors or other persons who have access to the watershed. Perhaps the most unsatisfactory feature in connection with the sanitary quality of this supply is the fact that the main line of the New York Cental railroad crosses the reservoir, thus affording opportunity for direct contamination of the railroad embankment and the reservoir itself through the use of toilets on passenger trains. Trouble has also been experienced in this reservoir due to algae growths, although such growths have been fairly satisfactorily controlled by the judicious use of copper sulphate. From the standpoint of both physical and sanitary quality the supply can not be considered satisfactory without purification, and in view of its comparatively small yield and difficulty and expense of independent purification, it will probabply prove more practical and economical to abandon the supply entirely at an early date.

(c) Patroons Creek and Sands Creek Supply:

The Patroons creek and Sands creek, which supply the West Albany shops of the New York Central railroad, have watersheds of 5.5 and 3.0 square miles respectively. Both of these watersheds are comparatively thickly populated, and the streams are consequently somewhat seriously contaminated. The water from these streams was formerly distributed through the Tivoli reservoir to a certain section of the lower part of the city. This reservoir, however, was abandoned in 1910, and this supply is now used exclusively by the New York Central railroad. The water used for railroad purposes is approximately 2,000,000 gallons daily. The Sands creek water is used at the round house, and the Patroons creek supply at the car shops.

A special investigation of the water supply of the West Albany shops was made by an engineer in this Division in November, 1919. Although these supplies are used mainly for industrial purposes, a portion however is used for drinking purposes at the car shops after purification by means of a small pressure filter. Between the shop distribution system and a line from the Prospect reservoir there is a cross connection which is said to be equipped with double check valves to prevent the railroad supply being pumped back into the reservoir. The double check valves were installed some years ago after creek water had been pumped back into the reservoir. Both of these supplies, owing to their unsatisfactory sanitary quality and the fact that they do not now receive adequate or efficient purification, should be effectively purified before use, or as with the case of the Rensselaer Lake supply, be permanently abandoned at an early date.

(d) Maeslandt Kill Supply:

The Maeslandt Kill supply, which has been developed by a small intake constructed across the stream about 1½ miles northwest of the purification plant. This supply furnishes water by gravity to a few houses on North street and to the filter plant. At the filter plant this water is used to operate various hydraulic water pumps in the laboratory, and for sand ejecting and washing. Above the intake the watershed has an area of approximately 1 square mile upon which are about 20 houses. Although the majority of these houses are fairly remote from the stream, there is, of course, ample opportunity for its contamination from accidental and incidental sources and from surface wash. The supply is relatively unimportant, is of questionable quality, and owing to the doubtful practicability and economy of developing it satisfactorily for domestic use, should be also abandoned or at least discontinued for drinking and other domestic purposes.

Sanitary Quality of Hudson River Water

The watershed of the Hudson river above the waterworks intake is approximately 8,270 square miles. Upon this area are situated a considerable number of cities and villages and many industries which discharge

sewage and wastes, generally without treatment, into the river and its tributaries. The character and extent of this pollution was made the subject of an extensive special investigation in 1908, the results and findings of which are set forth in full detailed reports published in the 28th Annual Report of the Department, Vol. 11, pages 409–477, and pages 604–631 inclusive. Without discussing in any detail the findings of these reports, it may be stated briefly that these investigations clearly established the fact that the Hudson river above Albany receives gross pollution from raw or only partially treated sewage of some 60 cities and villages comprising a total population of some 450,000 persons, and from the industrial wastes of some 150 mills and factories. The effect of this pollution upon the successful operation of the Albany filtration plant is obviously a serious matter. This pollution is clearly shown in the results of comparative analyses of samples of Hudson river taken at successive points along its course from the upper reaches above points of pollution, where the water is practically saturated with dissolved oxygen, the organic matter represented by oxygen consumed only 7.00 parts per million, and the total bacteria only 300 per cubic centimeter, to the lower point in the river just above the Albany intake where the dissolved oxygen has been reduced to about 50 per cent saturation, the organic matter increased to 20 parts per million, and the bacteria increased to 8,000 per cubic centimeter.

It is not to be inferred that the full effect or burden of the pollution from all of these municipalities and industrial plants is imposed upon the water filtration plant, for as was clearly pointed out in one of the reports referred to, there is a very marked recovery in the purity of the Hudson river due to self-purification of the water as it flows from the various points of pollution down the river. Two very significant facts do stand out clearly, however. One is, that the river does not readily recover from the heavy pollution from organic wastes contributed by certain classes of mills, particularly paper mills. This is clearly shown by a comparison of "oxygen consumed" figures, which increase from 7.0 parts per million above pollution at Corinth on the upper Hudson, to 33.0 parts per million below Fort Edward, where maximum intensity is reached. Below this point in the river the "oxygen consumed," though reduced somewhat, still remains over 22.0 parts per million, and is practically 25.00 p.p.m. at a point just above confluence of Mohawk river.

The other important fact is that between the junction of the Mohawk and Albany's intake, a distance of about 10 miles, a very large population, approximating 130,000 people, and a considerable number of mills, contribute sewage and wastes directly to the river without any treatment whatsoever. Owing to the partial treatment of sewage of the other municipalities on the watershed situated above the confluence of the Mohawk, and the self-purification that is accomplished in the reaches of these rivers above this point, it is obvious that the pollution from these nearby municipalities is that which causes the principal burden upon the operation of the Albany filtration plant. This fact is clearly demonstrated by a comparison of the analytical figures in the reports above referred to, which show that nearly all of the pollution constituents in the river, including organic matter and bacteria, are increased approximately 50 per cent between the point of confluence of Mohawk and Hudson rivers and the intake of the Albany water works.

The highly infectious character of the raw water is well known and has been repeatedly demonstrated. Prior to the construction of the filter plant, the city suffered for years from an excessive typhoid fever death rate. Even since the introduction of filtered water, typhoid fever or gastroenteritis outbreaks have occurred at times when satisfactory operative conditions have been seriously interfered with.

It will be recalled that one of these outbreaks occurred in 1913, during the spring flood, when the filter plant was flooded and raw river water was pumped into the city mains. Although warnings were published in all the daily papers against the use of the public supply without boiling, the disre-

gard of this warning resulted in the occurrence of some 232 cases of typhoid. A detailed description of this outbreak and the various actions taken by this Department in the suppression of it are covered in reports by the writer, published in the Annual Report of this Department for 1913.

Another instance occurred during the fall of 1917, when an undue prevalence of typhoid fever occurred in the city. The cause was at first apparently of obscure origin. The organic matter in the water during this period had been excessive. Alum treatment was not being applied to the water nor was this considered necessary in view of the fact that the water was being carefully filtered and chlorinated and that bacterial counts and B. coli were low. This type of organisms was not entirely absent, however, and after careful study of the situation by the Department the conclusion was reached that the cause of the typhoid fever prevalence was water infection. Upon advice of the Department, alum treatment was resumed. At the end of the incubation period following, due to the higher bacterial efficiency resulting from the alum treatment, the prevalence of the disease ceased.

Still again may be cited the recent outbreak of gastroenteritis in the city. During the latter part of February and the first part of March of the present year, a large number of cases of this malady occurred in the city, and upon investigation by the Department it was clearly shown that the water supply was the cause. It appears that some difficulty had been experienced by the city in securing shipments of alum, and with a limited supply of this chemical on hand, and with approaching floods in the river which would make the use of alum imperative, it had been decided to conserve this limited supply so that none was being applied to the water at the time of the outbreak. After a careful investigation, however, during which the cause of the outbreak was clearly traced to the water supply, the Department advised that alum treatment be resumed, a recommendation which was promptly carried out by the city authorities. Almost immediately on the resumption of the use of alum, and the resultant higher efficiency of filter operation, the outbreak of gastroenteritis subsided.

These experiences demonstrated clearly that with a water so heavily polluted as the Hudson river now is at the point of the city's intake, it is absolutely necessary that the highest degree of filter efficiency be maintained if the city is in the future to be free from a recurrence of gastrointestinal diseases. They mean, also, that without reservation every facility must be furnished to guarantee this efficiency and make it positive, simple, and uninterrupted. To accomplish this end will require not only the continuous application of alum throughout the year, as I have repeatedly advised, but will make desirable substantial changes in construction and operation of the filtration plant if the Hudson river supply is to be continued.

Sanitary Quality of the Filtered Supply

The operation of the purification plant is controlled by daily analyses, both chemical and bacterial. Samples are collected from various points in the process and at various times of the day. A study of the results obtained for the years ending September 30, 1917, 1918, and 1919, so far as the data were available from incomplete records kept during these years of the war period, shows a raw water, moderately high in color and turbidity and in organic matter, as shown by the figures for nitrogen in its various forms and for oxygen consumed. The total bacterial counts are excessive, and organisms of the B. coli type are present in large numbers. Analyses of the samples taken at various stages in the purification process show the reduction in color, turbidity, organic matter, and bacterial content. The final effluent is practically free from turbidity and only moderately colored. The total bacterial count is moderate, and practically no organisms of the B. coli type are isolated from the filtered and chlorinated supply.

While these analyses show a very high degree of filter efficiency and a quality of filtered water of very high degree of purity, it must not be overlooked that these results represent averages. They do not include

individual days, or longer periods, when these high averages would not be reached, nor do they reflect the inherent difficulties under which the plant has at times been operated, nor the serious troubles from outbreaks of disease resulting from these difficulties previously referred to. They do, however, clearly demonstrate that even in the face of these difficulties it is possible, with the careful supervision now given the plant, to turn out a filtered water supply of high average standard; and furthermore, that one is justified in assuming that if these difficulties and objections can be removed or overcome, a plant of this type, with equally careful operation, will produce continuously and without interruption a water supply of equally high standard.

Changes Needed in Construction and Operation of Water Supply System

(a) Filtration Plant:

Attention has already been called to the important fact that the organic content and turbidity of the Hudson river are at certain times of the year very high, and that at such seasons, particularly since 1914, it has been impossible to pass all of the effluent from the preliminary filters through the secondary filters. In fact, at times it has been necessary to by-pass some 60 per cent of the preliminary effluent around the secondary filters. This preliminary effluent is, owing to the present character and construction of the preliminary filters, not highly purified, and were it not for the final chlorination of this water, would be unsafe to deliver into the city mains. In other words, at these seasons of high turbidity and organic content the secondary filters are entirely inadequate in capacity to treat the whole supply, and the preliminary filters, though adequate in capacity, are not at present of proper construction to produce alone a water of satisfactory quality.

Again, the present sedimentation tank is in one unit, which necessitates its being put entirely out of service during periods when cleaning is required. Its large area without baffle walls permits cross-currents which decrease its settling efficiency. Furthermore, there is now no satisfactory means of mixing chemical solutions, nor any effective time interval provided for satisfactory coagulation to occur before the water enters the sedimentation basin.

It is obvious, then, that if the water is to be treated properly at all seasons of the year it will be necessary to correct these defects and supply the necessary omissions that now exist. A study of the existing structures with reference to the requirements that must be met indicates that it would be a simple and comparatively inexpensive matter to revise the present method of filtration without considerable alteration of structures and equip the entire plant on a straight "mechanical" basis. It would seem that this could best be done by:

1. Abandoning entirely the secondary filters as such, utilizing the various filter units for other purposes, such as a mixing channel. preliminary auxiliary settling chamber, and clear water storage.
2. Divide the present sedimentation basin by a division wall, making two independent basins or more of suitable shape; or dividing the basin by curtain or light baffle walls thus increasing the settling efficiency of the basin. This latter alternative might make necessary or desirable the use of conversion of one of the abandoned secondary filter units into a preliminary auxiliary basin of small capacity for temporary use when the large basin is to be cleaned.
3. Converting present preliminary filters into straight mechanical filters by removing present coarse sand and replacing with sand of approximately 0.5 mm minimum e|ective size and leaving the effective depth at least 30 inches.

If these changes were carried out, the filter plant as a whole would not only be improved in efficiency and flexibility of operation but would permit of being operated with more positive and uniform results. Capacity of the

remodeled preliminary filters would take care of a water consumption some 50 per cent greater than the present; and with proper and continuous coagulation and the same careful supervision now given the plant, would in connection with final chlorination furnish a water of high sanitary quality at all seasons of the year.

(b) Pure Water Conduit:

This clear water conduit, as previously pointed out, is under practically no internal head or pressure and is constructed for a considerable portion of its length in the bed of the old Erie canal, with a covering of only 2 to 5 feet above it. The conduit is composed of only a thin shell of iron surrounded with concrete, the thickness of which at the crown is less than 6 inches. It has been laid some 20 years, and an inspection years ago indicated that structurally it had deteriorated considerably and its strength impaired.

The water in the canal which flows in close proximity above the conduit receives considerable pollution, and it is obvious that any break in this line, or even leakage which would admit canal water into the conduit would be a serious matter, particularly since no treatment of this water takes place after leaving the filter plant, nor is any in fact practicable in a satisfactory manner at the pumping station. Although daily samples are collected of the water from this conduit near the pumping station for the purpose of determining contamination from leakage or breaks, it is obvious that should a break occur, and infected water enter this conduit, the condition would not be known or detected by means of these samples (which require at least 24 hours time for incubation) until after the damage had been done.

I can not too strongly emphasize the serious menace presented by this conduit, if its structural integrity is such as present information indicates, and it obviously represents potentially one of the weakest links in the water works system. To repair it satisfactorily appears difficult if not impracticable. It has been suggested that the canal now abandoned for transportation purposes might be secured from the State, filled in, and made a street. This, however, would involve uncertain structural features, and from a sanitary standpoint might involve even worse dangers from proximity to street sewers or other contaminating sources which would be created.

After a careful study of the situation with respect to this conduit, and with a full realization of the disastrous results that might follow an unexpected break or a sudden leakage into this gravity conduit, now weakened and unprotected, and the practical difficulty of correcting or meeting such an emergency, even assuming its remoteness, I am convinced that the only safe course to adopt now is to abandon this conduit at the earliest possible time and replace it with a new line of heavy castiron pipe. In this case there would be no serious objection to the filling in of the old canal and its conversion into a new street, in which case it would be wise so to develop it that no sewers or other possible contaminating sources would be constructed in the street or in any proximity to the new conduit.

(c) Excessive Water Consumption:

The present daily water consumption in the city is approximately 200 gallons per capita, which is about twice what it should be for a city of this character and indicates a serious waste of water. While part of this waste may be and is undoubtedly due to leakage in the mains, the major part is also undoubtedly due to carelessness in the use of water by the residents themselves and to leaky fixtures in household plumbing.

The seriousness of this is manifest, for it means that the expense of pumping and the cost of filtering the water, though probably not proportionately doubled, is largely increased. This situation has been repeatedly pointed out in reports of the present Commissioner of Public Works, Mr. Wallace Greenalch, and although nearly 50 per cent of the services in the city have been metered, largely through his efforts, the water consumption and waste is still excessive and should be reduced. This can only be effectively done through the metering of all services in the city, supplemented by a water leakage survey of water mains, and by enactment and enforcement of regulations requiring the repairing of leaky fixtures in all domestic and manufacturing service systems.

(d) Unsatisfactory Sanitary and Physical Quality of Upland Supplies:

It has been previously pointed out that the quality of water furnished from Rensselaer lake, from Patroons and Sands creeks, and from Maeslandt kill, are objectionable for domestic purposes on account of actual or potential contamination upon their respective watersheds, or inadequate purification. The total yield of these supplies is not much over 3,000,000 gallons per day, representing a little over 1/8 of the total supply. The use of these supplies under existing conditions is a menace to the health of those who are served by them, and to purify them adequately would be of questionable economy.

The necessity for using these supplies, if the changes recommended above for remodeling and increasing the capacity of the present filtration plant are carried out, would be removed, and in view of the unsafe quality of the upland sources of supply and the doubtful economy of satisfactorily purifying them, I am of the opinion that it will be wiser to abandon them entirely, with the exception perhaps of the Maeslandt kill supply which might be retained for special purposes at the filtration plant.

(e) Pollution of Hudson River Causes Overload on Filtration Plant:

The pollution of the Hudson river above the Albany water intake, due to the discharge of sewage and factory wastes, has already been discussed. Emphasis was laid on high organic content, represented analytically by "oxygen consumed," and contributed largely by certain mill wastes, more especially paper and pulp mills located along the upper Hudson at and above Glens Falls. Emphasis was also laid upon the excessive bacterial contamination from raw sewage discharged by certain nearby municipalities situated on the river above the city, including Mechanicville, Troy, Green Island, and Watervliet.

The first of these sources of pollution, the organic matter, tends to interfere materially with the successful operation of the filtration plant, particularly at seasons when turbidity in the water is very low. The second of these sources of pollution, the bacterial contamination from raw sewage discharge, tends to make this interference in the operation of the filtration plant a serious matter since this sewage is comparatively fresh and therefore highly infectious.

It would seem highly desirable, therefore, in connection with the improvements to be carried out as outlined above, that the attention of the city and State authorities be directed toward a reduction of the pollution in the river above the intake, particularly from the two sources referred to. Section 87 of the Public Health Law would apparently authorize the city, with the approval of the State Commissioner of Health, to institute proceedings against most of these municipalities to require them to install sewage disposal works for the purification of the sewage now discharged by them in a raw state into the river, now that the City of Albany has already made provision for the treatment of its own sewage. Concerning the reduction of mill wastes, however, it is probable that legislation would be necessary before these mills could be required to remove or purify their wastes, since most of these mills were in existence prior to the act of 1903 prohibiting such pollution and are at present specifically exempt from the provisions of this act.

Summary and Conclusions

Summarizing briefly the results of this investigation and in view of the foregoing it may be concluded:

1. That the principal source of supply, taken from the Hudson river, is in its raw state grossly polluted with sewage and factory wastes and is unsafe for domestic or drinking purposes without efficient purification.

3. That this water supply as delivered to the city, after purification by means of sedimentation, partial coagulation, preliminary filtration, partial secondary filtration, and final chlorination, has been generally of good sanitary and physical quality; but that owing to defects or difficulties in construction and operation this supply has at times been insufficiently purified and the cause of undue prevalence or outbreaks of waterborne disease.

3. That owing to the highly infectious character of the raw Hudson river supply, to the defects and difficulties in construction and operation of the filtration plant, certain changes and alterations in arrangement, construction, and operation of the filtration plant are necessary.

4. That the pure water conduit is in its present location and structurally deteriorated condition subject to possible breaks or leakage and is potentially a serious menace to health.

5. That the upland sources of supply taken from Rensselaer lake, Patroons and Sands creek, and Maeslandt kill, are subject to dangerous contamination, are either not purified or are inadequately purified, and are in their present condition a menace to health.

6. That a large amount of the water furnished the city is wasted through leakage in water mains, leakage in domestic service fixtures, and carelessness on the part of residents in the household uses of water, the result of which is largely to increase the cost of construction, equipment, and operation of the filtration plant and pumping stations.

Recommendations

In view of the conclusions above reached, I beg to submit the following recommendations:

1. That with respect to the filtration plant the following changes and additions be made in construction and operation:

(a) The present sedimentation basin be subdivided into at least two settling compartments by suitable division walls in order to provide more effective sedimentation.

(b) That a preliminary coagulation and mixing basin be arranged in one of the present slow sand filters to be abandoned, in order to provide proper mixing of chemical solutions and better coagulation.

(c) That the present secondary filters be abandoned as such, the sand removed, and the filter units converted into a clear water basin a coagulation and mixing tank, and possibly an auxiliary sedimentation tank.

(d) That the preliminary filters be converted into straight mechanical filters by removing present coarse sand and substituting a finer sand of suitable effective size, the depth of which should be kept at least 30 inches.

(e) That the raw water before filtration be subjected to alum treatment and sedimentation without interruption at all seasons of the year.

2. That the pure water conduit leading from the filter plant to the pumping station, the structural condition of which has been found to be impaired. be abandoned and replaced by a castiron main; and that during the interval of this replacement an emergency chlorination plant be installed at the Quackenbush pumping station for emergency use in case of a break or leakage into the line, this provision to be supplemented by a systematic plan of inspection and action which will permit the detection without delay of any break or leakage in the line and the immediate application of corrective measures.

3. That the present upland sources of supply derived from Rensselaer Lake, Patroons and Sands creeks. and Maeslandt kill, be abandoned for domestic and manufacturing purposes as soon as the changes and additions to the filtration plant recommended above are completed.

4. That additional steps be taken at once by the city to reduce the present excessive water consumption and leakage by —

(a) The introduction of water meters on all household and manufacturing service lines.

(b) A water leakage survey of all streets and domestic service mains in the city and the repairing of all leaks found.

(c) The institution of a house to house inspection of domestic plumbing systems and the establishment and enforcement of regulations requiring property owners to repair all leaks discovered.

5. That steps be taken by the city, with the cooperation of this Department, and if necessary through proceedings instituted under section 87 of the Public Health Law, to induce or require the nearby municipalities on the Hudson river above the Albany water intake so to treat their sewage as to lessen the burden now imposed upon the filtration plant resulting from this pollution.

In closing, I desire to acknowledge the courteous assistance rendered during the investigation by Mr. Wallace Greenalch, Commissioner of Public Works, Dr. Arthur Sautter, Health Officer, and Mr. G. E. Willcomb, Supervising Chemist of the filtration plant.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *April* 12, 1920

The water of this supply is used by the New York Central and the Boston and Albany railroads for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on November 10, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were satisfactory, and that the results of the inspection and the analyses of the samples, together with the results of previous inspections and analyses, indicate that the water is of satisfactory quality for human consumption. A copy of the report accompanied this data. Based on this information, the United States Public Health Service on November 17, 1920, issued a provisional certificate permitting the temporary use of the water for drinking and culinary purposes in interstate traffic.

ALBION

A reinspection of the water supply of the village of Albion was made on October 16, 1920, by Mr. Earl Devendorf, assistant engineer. Previous inspections of this supply were made by this Department in 1915, 1916, and 1919, the reports upon which are published in the Annual Reports of the Department for the respective years.

Albion is a village of some 4,700 inhabitants located in the central part of Orleans county, 30 miles northwest of Rochester. The public water supply is owned by the village and operated under the direction of a Board of Trustees, of which Mr. F. H. Rhodey is president and Mr. L. Woolston is superintendent. The supply is derived from Otter creek, and from driven wells located near the purification plant. The water flows by gravity from the storage reservoirs to the purification plant, from which it is pumped after treatment into the village distribution system, the excess over consumption going to a standpipe located in the village having a capacity of some 275,000 gallons. Water from the wells is also pumped after purification into the village distribution system. About 90 per cent of the inhabitants are served with the public water supply.

The purification plant consists of sedimentation and coagulation basins, two gravity mechanical filters, and hypochlorite tanks equipped with constant head orifices. The amount of alum being used at the time of the inspection was said to be 120 pounds per day, or 150 pounds per million gallons, which with the amount of water pumped last month amounted to 1.05 grains per gallon. The amount of hypochlorite, the lime being used, was 11 pounds per million gallons or .43 p.p.m. The filter is washed twice daily, using approximately 20,000 to 30,000 gallons of filtered water. In washing the filter air is used to break up the sand for approximately five minutes. Then water is turned on for about ten minutes. After washing the filter water is wasted for a period of about ten minutes.

The engineer from this Department was informed that about a year ago the water consumption arose suddenly above the normal amount pumped and has since remained above the previous record of pumping. For this reason it is believed that there is a large leak or leaks in the distribution system. Unless adequate means are taken to discover and eliminate this leakage, the capacity of the present filter plant may soon be exceeded and it will be necessary for the village to consider the matter of increasing the capacity of the present purification plant. The village has not engaged the services of a consulting expert to supervise the operation of the plant, as recommended in the last report.

Samples of the water taken on October 1, 1920, and analyzed by the Division of Laboratories and Research, showed the following bacteriological results:

	Raw water	Treated water
Bacteria per c.c 20°C	1600	17000
Bacteria per c.c 37°C	530	5400
Colon type in 10 c.c	3+0—	3+0—
Colon type in 1 c.c	1+2—	3+0—
Colon type in 1/10 c.c	0+3—	0+3—

The results of the examination show a bacterial increase over the raw water total count, indicating that the filtration was not effective as regards the removal of bacteria. The presence of B. coli in the 10 c.c. and 1 c.c. inoculations examined indicated a water of unsatisfactory sanitary quality and that the purification plant was not being effectively operated.

As a result of the inspection it was recommended that in view of the recent unsatisfactory analytical results indicating the ineffective operation of the purification plant, the officials in charge of the public water supply give more careful attention to the quantities of chemicals being used and the regularity of their application, increasing the quantity if necessary; and that they continuously operate the purification plant in such a manner as to furnish a water of satisfactory sanitary quality at all times to the residents of Albion; that, as previously recommended, the village employ the services of a competent expert to supervise the operation of the purification plant; and that the village authorities in charge of the public water supply endeavor to locate and eliminate any leaks in the public distribution system.

AMENIA

A reinspection of the water supply of the village of Amenia was made on May 29, 1920, by Mr. W. J. Erickson, engineering assistant. A previous inspection of this supply was made by this Department in 1912, the report upon which is published in the Annual Report of the Department for that year.

Amenia is an unincorporated village in the northeastern part of Dutchess county, on the Harlem division of the New York Central railroad. It has a present population of about 800, practically all of whom are served by the public water supply. This supply is owned and operated by the Amenia Water Company.

The water is derived from two sources: a spring or upland supply, and two driven wells in the flats south of the village. From the spring supply the water flows by gravity to the distribution system, consisting of 2¾ miles of mains varying from 1 to 6 inches in diameter. There is no method of accurately determining the consumption. The well supply which is usually used only in the summer months is pumped into the mains against the pressure maintained by the reservoir. The system is practically the same as described in the previous report.

The wells are located near the banks of a stream 175 feet from the main street in the village. One is 10 feet and the other 20 feet from the stream. They are driven through 30 feet of clay to water-bearing gravel.

The ground immediately around the wells is flat and low, through which the stream meanders. One of the wells is located under the pump house, while the other is about 15 feet from it. The latter well opens into a 5-foot by 5-foot wooden box. The top of the casing is open to allow the water to flow over the top, which acts as a circular weir. There is a possibility for the creek water to enter the well through this open casing at times of high water and thus pollute the supply. There are numerous houses and 5 privies within 100 feet of the wells. House drains from above buildings discharge into the stream near the wells. Adjacent to the wells is the gas manufacturing plant, which is operated by the same company which owns the water supply. The spent carbide is strewn over the ground and the liquid seeps over the wells, making a very unsightly appearance.

As a result of this inspection it was concluded that the upland supply is derived from a source which should yield a satisfactory supply if properly protected from pollution, but that the well is very badly located and subject to contamination.

It was therefore recommended that the company continue to maintain the upland supply in a satisfactory condition, making regular inspections to locate and eliminate any source of pollution; that a new supplementary supply of satisfactory sanitary quality be developed, and upon the completion of the work the wells be abandoned; and that, pending the development of a new supply, the casings of the wells be provided with water-tight caps and the pump house and vicinity of the wells be kept in a neat and sanitary condition.

AMITYVILLE

A reinspection of the water supply of the village of Amityville was made on May 11 and May 20, 1920, by Mr. Henry Ryon, assistant engineer. A previous inspection of this supply was made by this Department on May 13, 1915, a report upon which is published in the Annual Report of the Department for that year.

Amityville is located on the south shore of Long Island, in Suffolk county, about 34 miles from New York city. The resident population of the village is about 3,500, increasing, however, to about 4,000 during the summer months.

The water supply is owned and controlled by the Amityville Water Works Company. The source of the supply consists of four driven wells, from which the water is pumped into the distribution mains, the surplus going to a standpipe. The plant is located on the south side of the railroad tracks a little west of the center of the village. About 80 per cent of the population is served with water from the village supply. The water consumption averages about 150,000 gallons per day during the winter and about 250,000 gallons per day during the summer, corresponding to per capita rates of about 45 and 65 gallons per day. The maximum and minimum rates of consumption during 1919 were 432,000 and 143,000 gallons per day respectively.

Three of the four wells are located within about 75 feet of the pumping station, and a third in the basement of the electric power station a little over 100 feet west of the pumping station. The well casings are all 10 inches in diameter. Two of the suction pipes extending down into the casings are 8 inches in diameter, one 6 inches, and the fourth 4 inches in diameter. The wells are said to be 60 feet deep, the lower 18 feet, consisting in each case of a slotted brass strainer. In three of the wells the strainers are attached to the suction pipes and not the casing, one length of casing having been withdrawn in each case after the strainer was placed. In the fourth well, however, known as the North well, the strainer is attached to the casing, and the suction pipe hangs free within it. All the casings have been cut off about 11 feet below the surface of the ground. Four-foot circular brick manholes fitted with conical wooden covers have been provided to protect the three wells located near the pumping station. The

well in the basement of the electric power station is protected by a small square manhole covered with removable plank. The vertical sections of the wells are at the level of the top of the casings connected to horizontal suctions leading to the main suction header in the basement of the pump house.

The ground around the wells slopes away from them in all directions, and the possibility of surface water reaching them is very remote even at times of heavy rainfall occurring when the ground in the vicinity is not in condition to absorb much water. The possibility of the accidental contamination of the water by any person other than the attendant is practically impossible, since the plant is surrounded by a high wire fence surmounted with several strands of barbed wire and the gates of the enclosure kept closed and locked at all times.

The density of the population within one-quarter of a mile of the wells is equivalent to about 1,100 people per square mile, within one-half mile of the wells about 750 people per square mile, and immediately outside of this area about 150 persons per square mile. The possible sources of pollution in the immediate vicinity of the wells consist of a privy provided with removable wooden container located on the water company's property about 75 feet from the nearest well, and the privy of the Long Island depot, which is provided with earth vault and no container located about 250 feet from the wells.

There is no sewerage system in the village, all the houses having privies and cesspools. The nearest house is about 300 feet from the wells. About 1,000 feet north of the wells there are three private insane asylums, provided with disposal plants, at all of which the method of finally disposing of the effluent consist of absorption by the soil. The high free ammonia and nitrate content and the high chlorine content of the water, as shown by the results of the analyses, seem to indicate that polluting matter from the privies, cesspools, and sewage disposal plant is reaching the wells; and the material increase in the chlorine figure and the great increase in the free ammonia figure over the figures for 1915 seem to indicate that the quantity of polluting matter is becoming greater each year. It is possible, however, that at any time, due to changes in the ground water flow caused by variations of weather conditions or the draft on the wells, active contamination may reach the water, and for this reason the water supply cannot be regarded as entirely satisfactory. It is apparent, as pointed out in our previous report, that the increasing population of the village will eventually affect the quality of the water and render it dangerous for human consumption without treatment. It would seem advisable that samples of the water should be frequently taken and analyzed to detect the presence of active contamination, and should the presence of such contamination be detected apparatus for the proper treatment should be installed and put in operation.

Appearances seemed to indicate that during the period of heavy rains and thaws just prior to the time of the inspection the ground water had been higher than normal and possibly above the tops of the well casings. This would mean, particularly in the North well, that the water from the upper strata of soil had entered the wells through the space between the casing and the suction. No examination of the water from this strata has been made, and since it is possible that this water might contain active pollution when the water from the lower strata might not, it would seem advisable to take measures to prevent the entrance of such water into the wells, at least until it has been positively demonstrated that its quality is satisfactory. Sealing the space between the casings and suctions and carefully watching the wells at times of high water would seem desirable.

The well in the electric station is in the lowest part of the basement, under the pump mentioned below, and there is a possibility that water spilled on the floor of the basement near the pump might find its way into the well through the annular space between the casing and the suction. This annular space is apparently protected by a ring, but it was not possible for the engineer making the inspection to determine whether or not the joint was tight. It would seem desirable that the opening between the casing and

the suction should be made absolutely watertight. It would also seem advisable that the manhole at the top of this well should be provided with a concrete bottom and the top arranged so that the water will drain away from it, and that a new cover for the manhole should be provided.

At the time of the inspection the standpipe, which is located only a few feet from the south well, was leaking at the rate of probably 15 or 20 gallons per minute; and this leakage flowing into the valve chamber at the foot of the standpipe and from there through the pipe installed for the purpose into the manhole at the top of the south well. This manhole, at the time of the inspection, with the pumps operating, contained several feet of water, indicating, since there is no floor in the manhole, that the soil between the surface and the water bearing strata is not extremely porous; and also that while the annular space between the casing and the suction pipe is open, conditions at the bottom of the casing and above the strainer are apparently such that water does not pass very rapidly through the annular space between the casing and the suction to the gravel around the strainer. The water leaking through the standpipe is, of course, of as satisfactory sanitary quality as that from the wells, but the fact that it is exposed for a short distance as it passes from the standpipe to the south well to possible accidental or wilful pollution makes the existing condition an undesirable one, and it would therefore seem that steps should be taken to repair the standpipe immediately and thus remove one possible source of contamination of the water.

In April, 1920, there was an outbreak of typhoid fever in Amityville. Seven cases were reported, the onsets of all of which occurred about April 10. The patients were of different ages and social conditions and widely scattered over the village, one patient living outside of the village limits. To date, no evidence has been obtained definitely to fix the cause of the outbreak; and as may be inferred from the facts about the water supply given above, there is nothing to prove that the quality of the water supply was connected with the outbreak of typhoid, although as was pointed out above, there is a possibility that active contamination may have reached the water supply due to changes in the ground water flow or by accidental means. While, therefore, there is no evidence definitely to show that the water supply was in any way connected with the epidemic, this does not prove that the quality of the water supply was not the cause of the typhoid, and for that reason the conditions surrounding the supply and the quality of the water should be carefully watched, particularly at times of extremely dry and extremely wet weather, to detect any indication of active pollution.

From the results of the investigation of the sanitary quality of the water supply of Amityville, it was concluded that while the water is usually free from active contamination, many potential sources of pollution exist, and that the examination of the water indicates that it receives a large amount of polluting matter which under normal condition is rendered inactive by passing through the soil but which may become active at any time.

It was therefore recommended —

1. That the water company continue to exercise regular and careful supervision over the operation of the plant and the conditions of the ground around the pumping station and wells.

2. That samples of the water be examined at frequent intervals, and particularly at times of extremely dry and extremely wet weather conditions, to detect the presence of any active contamination.

3. That should any such active contamination be discovered, the company immediately proceed to sterilize the water with liquid chlorine or purify by other satisfactory means, and if possible discover and remove the source of contamination.

4. That the leak in the standpipe be immediately repaired.

5. That the present leakage from the standpipe and the water from the valve manhole at the foot of the standpipe be disposed of by means other than draining into one of the wells.

6. That measures be taken to prevent the entrance of any water into the wells through annular space between the well casings and the suctions.

ANTWERP

A reinspection of the public water supply of the village of Antwerp was made on October 22, 1920, by Mr. A. I. Howd, assistant engineer in this Department, a previous inspection of this supply having been made by the Department on September 14, 1918.

Antwerp is an incorporated village with a population of about 1,100, and is located in the northeastern part of Jefferson county, about six miles northeast of Philadelphia. About 90 per cent of the total population are served with water from the public supply.

The water supply is derived from Indian river, and is pumped into the mains without purification. Above the intake the Indian river has a watershed area of about 157 square miles, on which there is a scattered population of 3,000 people. The stream receives pollution from cultivated fields, pastures, and the farm houses and small settlements on it, and is also subject to pollution from the village of Antwerp itself. The waterworks pumping station is located at a dam across the river at Main street, and the intake pipe extends about 1,200 feet up the bed of the stream. The sewage from some twenty properties discharges into the pond below the intake, and the sewage and sink wastes from about six properties discharge into the river directly above the intake of the water supply.

Our report of the inspection of 1918 pointed out that the public water supply of the village, pumped unpurified from the Indian river, was subject to contamination and unfit for human consumption. It was recommended in that report that the supply either be abandoned or some suitable method of purification installed. The present inspection discloses the fact that none of these recommendations had been carried out.

In the early part of October, 1920, the village experienced an outbreak of typhoid fever. There were five cases and one death. An investigation disclosed the fact that milk, ice cream, and shell fish might reasonably be excluded as being possible causes of the outbreak. All of the cases had access to the public water supply. It seems probable, therefore, that the cause of the outbreak was the use of polluted water from the public supply, and that the outbreak might have been avoided had the previous recommendations of this Department relative to the purification of the water been carried out.

It was therefore recommended that the village authorities take immediate steps to carry out the recommendations of the previous report; that the present water supply either be treated by some suitable method which will furnish a safe and wholesome water, or abandoned and a new source of supply developed; and that pending the installation of a purification plant or the securing of a new supply, the present supply be continuously sterilized by the application of liquid chlorine.

BABYLON

A reinspection of the water supply of the village of Babylon was made on May 20, 1920, by Mr. Alfred Mullikin, assistant engineer. A previous inspection of this supply was made by this Department in 1915, a report upon which is published in the Annual Report of the Department for the year 1916.

Babylon is located in the southeastern part of the town of Babylon, on the Montauk branch of the Long Island railroad, about 39 miles from New York city. The present population is estimated at about 3,300, of whom all are served with the public water supply. The waterworks are owned and operated by the Sumpwams Water Company.

The water supply is derived from four driven wells located in the northeastern part of the village, about 400 feet east of a branch of the Sumpwams river, on a triangular plot of land about 10 acres in area owned by the

water company. In addition to the village of Babylon, water from these wells is also supplied to the unincorporated villages of Lynhurst and West Babylon. The average daily water consumption varies. The summer consumption is approximately 350,000 gallons, and the winter consumption approximately 250,000 gallons, or about 75 gallons per capita per day.

The wells consist of four 8-inch driven wells and one 6-inch well, ranging from 45 to 60 feet in depth. Three are covered with stone covers and one with a wooden cover. The 6-inch well north of the plant and the 8-inch well south of the plant have been abandoned. There are no houses in close proximity to the wells except the residence of the engineman, which joins the pumping plant. The sewage of this residence flows through a tile pipe into a brick cesspool located 150 feet or more south of the nearest well. This pipe passes within 3 or 4 feet from one well, which has been abandoned, in accordance with the recommendations of this Department. The sewage from a toilet located at the extreme northeast corner of the plant flows into a brick cesspool about 150 feet west of the wells.

The results of the analyses of samples of water taken at the time of the inspection showed a water clear, colorless, and very soft. The figures for nitrogen in its various forms, with the exception of albuminoid ammonia, were rather high, indicating the presence of some decomposing and decomposable organic matter, most of which has been oxidized by the natural processes of purification in its passage through the soil. The chlorine is normal for the locality. The total bacterial count was fairly high but the absence of any bacteria of the colon type showed a water free from active contamination at the time the samples were collected.

As a result of the reinspection of the public water supply of Babylon, it was concluded that the supply was in fairly satisfactory condition at the time of the inspection, and it was therefore recommended that the authorities in charge of the public water supply continue their careful supervision over the area in the vicinity of the wells to prevent any possible pollution of the soil.

BALDWIN

A reinspection of the water supply of the village of Baldwin was made on May 18, 1920, by Mr. Alfred Mullikin, assistant engineer. A previous inspection of this supply was made by this Department in 1915, the report upon which is published in the Annual Report of the Department for that year.

Baldwin is located in the southern part of the town of Hempstead, on the Montauk branch of the Long Island railroad, about 24 miles from New York city. The population is estimated at approximately 4.000, of which about 50 per cent are served with water from the public supply. The water works are owned and operated by the Baldwin Water Company.

The water supply is derived from six driven wells about 30 feet deep located near Milburn creek about a half mile northeast of the village and a quarter of a mile north of one of the pumping stations of the Brooklyn waterworks. From the wells the water is delivered by pumping into a distribution system consisting of about 30 miles of castiron pipe. An elevated steel tank 22 feet in diameter and 30 feet high, having a capacity of 110.000 gallons, is located on a tower near the pumping station and acts as an equalizing reservoir.

From the recent inspection it appears that the recommendations of the previous reports of this Department have been carried out. The old cesspools at the engineer's residence have been abandoned and a new tar-coated brick and cement cesspool constructed 95 feet west of the nearest well. This cesspool is cleaned out every 14 days and the contents hauled to a remote place for final disposal. The water company has purchased additional land in an easterly direction to the creek about 250 feet away. Analyses of the water are made once a year.

The results of the analyses of samples of water taken at the time of the inspection show a water slightly turbid, colorless, and moderately soft. The figures for nitrogen in its various forms are rather high, and indicate the presence of decomposing and decomposable organic matter. The value for chlorine is above normal for the locality. The total bacterial count is high for a well water, but no bacteria of the colon type were found, indicating that the water was free from contamination at the time the samples were taken.

As a result of the reinspection of the public water supply of Baldwin, it was concluded that the authorities in charge of the water supply have carried out the previous recommendations of this Department, and that the public water supply of the village, although not dangerously contaminated at the time of this inspection, is subject to pollution which, while apparently rendered inactive in its passage through the soil, may at any time become active and dangerous.

It was therefore recommended that lids or covers be provided for the tile casings to prevent surface wash and foreign matter from entering the well supply, that the wooden pits surrounding the tile wells be made of brick or some impervious material in order that a watertight condition may exist, and the walls extended sufficiently above the surface of the ground to prevent surface wash from entering the wells, and that the village authorities maintain a careful sanitary patrol over the area in the vicinity of the wells at all times.

BALDWINSVILLE

Reinspections of the water supply of the village of Baldwinsville were made on January 29, 1920, by Mr. Alfred Mullikin, assistant engineer, and on May 27, 1920, by Mr. Earl Devendorf, assistant engineer. A previous inspection of this supply was made by this Department in 1918, a report upon which is published in the Annual Report of the Department for that year.

Baldwinsville is situated on both sides of the Seneca river, in the northwestern part of Onondaga county, some 15 miles north of Syracuse. It has a population of 3,200, 90 per cent of whom are served by the public supply.

The water supply is owned by the village and operated under the direction of the Board of Water Commissioners. The supply is derived from a shallow well 20 feet deep, having a steel casing 20 feet in diameter provided with a conical steel roof. The well is located in the southwestern section of the village, and the water level in the well stands about 10 feet below the ground surface. The water is pumped to a standpipe, from which it is distributed by gravity to the village distribution system.

The ground surrounding the well is graded in such a manner as to prevent surface water from coming in contact with the well casing. The 6-inch tile sewer line located about 100 feet north of the well is still in use.

Samples of water were collected on May 27, 1920, and sent to the Division of Laboratories and Research for analyses. The results of these analyses show a hard water of good physical quality as regards color and turbidity. The amount of nitrogen present in its various forms indicated the presence of moderate amounts of decomposing and decomposable organic matter. The total bacterial count of the sample collected from a tap in the village was very high, but this was probably due to the multiplication of harmless forms of water bacteria since the containers were three days in transit. The results of the bacterial examination show the absence of organisms of the B. coli type in all of the inoculations examined.

In view of the above, it was recommended that the village authorities consider the former recommendations of obtaining a new well supply from a point approximately 1,000 feet west of the present well, and that the village authorities install immediately a chlorination plant for the sterilization of the public water supply with liquid chlorine and operate the same in a careful and efficient manner until a new source of supply is obtained as formerly recommended.

BEDFORD HILLS (State Reformatory for Women)

Plans for a new 6-inch driven well, 50 feet deep, to be located 50 feet from the brook and 90 feet farther upstream than the three existing wells, were submitted to this Department for approval by the State Architect on September 13, 1920. The plans consisted of architect's drawing No. 2041, and specification No. 3599. After careful examination and full consideration of the essential features of the design, the plans were approved on September 17, 1920.

BERLIN

A reinspection of the water supply of the village of Berlin was made on October 11, 1920, by Mr. W. J. Erickson, sanitary inspector. Previous inspections of this supply were made by this Department in 1909 and 1917, the reports upon which are published in the Annual Reports of the Department for the respective years.

Berlin is an unincorporated village of about 750 inhabitants, located in the eastern part of Rensselaer county about 15 miles east of Troy. The waterworks are owned and operated by the Berlin Water Works Company. About 75 per cent of the population of the village use the supply.

The water is derived from a spring fed brook located southwest of the village, and from Kendall pond located about a mile and a half southwest of the village. The supply is conducted to a distributing reservoir of 250,000 gallons capacity located on a hill southeast of the village. From this reservoir the water is delivered to the consumers by gravity through a distribution system consisting of 2 miles of mains ranging from 1 to 6-inches in diameter, on which there are some 90 service taps none of which are metered. The consumption is about 75,000 gallons per day, a quarter of which is used for industrial purposes.

The supply was formerly derived from two brooks and two springs located about a mile southwest of the village; and from the outlet of Kendall pond at a point about one-half mile east of the pond. It was also possible to divert the water coming from the tailrace of the hydro-electric plant which drains its water from Kendall pond into the intake on the outlet of the pond. The two brook supplies and the southerly spring supply have, however, been abandoned, and since no water now overflows from Kendall pond, the supply is now obtained solely from the northerly spring and from the tailrace of the hydro-electric plant, and the watershed of the former outlet of Kendall pond. The water is taken from the pond through a flume, and after being used to turn a water turbine is emptied into a small basin across the road from the power station. From this basin it is conducted by an 8-inch main to the distributing reservoir.

The area tributary to Kendall pond is about .35 square mile in area. It is rather flat, and that part bordering the pond almost entirely wooded. There are nine camps on the shore of the pond whose privies are set back from the water and which are only used for a few weeks in summer. The watershed tributary to the stream that was formerly the outlet of the pond is about .1 square mile in area and on the steep side of a hill. The only possible source of pollution of a permanent nature on this watershed is the road and from the power station. Both are subject, however, to chance pollution by visitors and campers.

The spring supply is derived from several springs, the water from which after issuing from a shale formation flows over the ground in a natural stream. The intake was very poorly developed. It appeared to be only a small pool at the side of the stream. If there has been a dam it has been washed away by the spring freshets. The intake pipe, though screened by a ¼-inch wire mesh, was not visible because of the mud and leaves covering it. From this intake the supply flowed by gravity to the distributing reservoir a mile away. The watershed tributary to the spring supply which is about one-fourth of a mile in area, is unpopulated and only one little used

road crosses the upper end of it. The only possible sources of pollution are from this road and from the pasturing of cattle.

From the above facts it was concluded that the spring supply is of reasonably satisfactory sanitary quality though subject to pollution from pasture lands, but that the Kendall pond supply is at times subject to pollution from campers on the shores of the pond, while its aesthetic quality is depreciated by high color.

It was therefore recommended that the spring supply be conserved by the construction of a small intake dam and basin and the Kendall pond used only when necessary; that the water company take immediate steps to prevent the pollution of the water from the sources mentioned in the body of the report, and that should any difficulty be experienced in doing this, they apply to this Department for the enactment of rules and regulations for the protection of the sanitary quality of the water supply.

BERNE (Camp Orinsekwa)

Inspections of the water supply used at Camp Orinsekwa, Warner's Lake, Albany county, N. Y., were made by Mr. Earl Devendorf, assistant engineer in this Department, on April 10, July 16, and September 9, 1920, and reports and letters of advice regarding the sanitary condition of the camp sent to Miss Jeanette Frank, owner of the camp.

BINGHAMTON

The water of this supply is used by the Delaware, Lackawanna and Western, the Erie, and the Delaware and Hudson railroads for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on October 18, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were satisfactory, and that the results of the inspection and the analyses of the samples, together with the results of previous inspections and analyses, indicate that the water is of satisfactory quality for human consumption. A copy of the report of November 13, 1920, accompanied this data. Based on this information, the United States Public Health Service on November 11, 1920, issued a certificate permitting the use of the water for drinking and culinary purposes in interstate traffic.

BRIDGEHAMPTON

A reinspection of the water supply of the village of Bridgehampton was made on June 3, 1920, by Mr. Alfred Mullikin, assistant engineer. A previous inspection of this supply was made by this Department in 1915, the report upon which is published in the Annual Report of the Department for that year.

Bridgehampton is located in the eastern part of the town of Southampton, on the Montauk branch of the Long Island railroad, about 97 miles from New York city. The population has a slight seasonal variation, and amounts to 1,475 in winter and 2,500 in summer, all of whom are served with water from the public water supply. The waterworks are owned and operated by J. A. Sandford & Sons, Inc.

The water supply is derived from three driven wells located some 2,000 feet southeast of the railroad station, in a thickly populated section of the village. From the wells the water is pumped into tanks under air pressure, and then it is forced through a distributing system consisting of some 4¼ miles of castiron pipe ranging from 2 to 6-inches in diameter.

The wells are located in the basement of a hardware store owned by the water company, and consist of two 6-inch driven wells, 75 and 85 feet deep, respectively, and one 3-inch driven well 315 feet deep. The top of these wells terminate in the bottom of a brick pit irregular in plan, measuring 14 feet by 12½ feet with a depth of 11 feet below the basement floor. The basement floor is about 5 feet below the surface of the ground. The pit is provided with a concrete bottom over which a depth of about 2 feet of water containing oil remains. This water accumulates from leakage from the pumps and from two spiggots connected on the discharge line which drain directly into the pit. Due to old and worn construction material both in the foundation and well casings, it is possible that the accumulated waste may become a source of pollution. The water is pumped from the pit occasionally by the operation of a 1½-inch rotary pump. The strata through which the wells pass is loam and clay to a depth of 5 feet, sand to a depth of 70 feet, clay to 100 feet, sand and gravel to 135 feet, gray clay to 140 feet, sand to 170 feet, gray clay with fragments of shells to 190 feet, sand to 220 feet, sand and lignite to 230 feet, lignite to 237 feet, sand to 275 feet, lignite to 280 feet, clay to 290 feet, and white sandstone formation to 312 feet. The clay strata through which the wells pass are probably small pockets. Such formations are characteristic of Long Island, and these layers of clay are not necessarily of great protective value.

Aside from the area of the dwelling house, no area of land is reserved for the water supply. The plant is located in a thickly populated section of the village and indirect opportunities for pollution are numerous. The village is not provided with a sewerage system, the houses being served by privies and cesspools. The nearest privy is about 200 feet south of the wells. There is a cesspool approximately 300 feet southwest of the wells which provides for three houses just west of the plant. North of the plant there are numerous houses each of which is provided with an individual cesspool, the nearest being 200 feet distant from the wells. About 200 feet east of the plant there is a graveyard.

From the recent inspection it appears that the Water company has in part carried out the previous recommendations of this Department, in that one of the two privies within 200 feet of the well supply has been removed: that watertight removable containers are not provided for all privies within 500 feet of the well supply; that a sewerage system has not been constructed to take care of the sewage in the vicinity of the wells; that analyses of the water have been made about once a year.

As a result of the inspection it was recommended that the Water company carry out at once our previous recommendations; that all privies within a distance of 500 feet from the wells be provided with water-tight containers, and all cesspools within that distance be made water tight; that the Water company cooperate with the village officials with a view of making arrangements for the installation of a properly designed sewerage system; and that should active contamination at any time be found present in the water, the supply be sterilized with liquid chlorine, or a new and satisfactory source of supply developed.

BUFFALO

An investigation of the water supply of the city of Buffalo was made on March 30 and 31, 1920, by Mr. Earl Devendorf, assistant engineer of this Department.

Buffalo is a city of some 515,000 inhabitants, located in Erie county, at the eastern end of Lake Erie, and is a great railroad center, fourteen railroads entering the city. The geographical location of Buffalo being in the center of the Niagara Falls power district, together with its great transportation facilities, make it a very great industrial and manufacturing center. The city is served by a comprehensive sewer system, the sewage collected therein being discharged through three main outlets directly into Buffalo creek and Niagara river.

The city is operated under a commission form of government which was first inaugurated January 1, 1916. The public water supply is owned by the city and operated under the Board of Public Works, of which Mr. Arthur Kreinheder is Commissioner, with Mr. George C. Andrews as Commissioner of Water. The Water Department is a large organization with various divisions for official supervision, operation and maintenance, purification, pumpage, and a recently organized pitometer division, the work of which consists of making surveys for the elimination of water waste. The supply is derived from Lake Erie, from which the water is pumped, after chlorination, through two pumping stations into the distribution system.

When the city took possession of the supply in 1868, the water was pumped from the Niagara river, the intake being located on Bird Island pier. The Niagara river intake pier, located opposite the Massachusetts avenue pumping station, was first built in 1870, enlarged in 1895, and reconstructed in 1906. After a severe typhoid outbreak which occurred in 1894, the source of which was traced to the public water supply obtained through the auxiliary intake located on Bird Island pier, this intake was permanently closed. In 1907 construction was started on the Emerald Channel intake, and tunnels and a new pumping station now known as the Porter Avenue pumping station. The work was completed and the new station started in operation in 1914.

The Massachusetts Avenue intake extends into Niagara river about 1,000 feet from shore, and is located in approximately 16 feet of water. The river current at this point varies from 8 to 10 miles per hour. This supply is often contaminated at times of flood, when the polluted waters of Buffalo harbor would be carried out into the river current at this point.

The Emerald Channel intake is circular in form having an inside diameter of 70 feet, the superstructure of which consists of concrete walls 20 feet in thickness encased with ⅜-inch steel shell plates inside and out. On this superstructure a circular steel building is located and serves to house the chlorination apparatus, generator, boilers, and pumping equipment used in operation of the chlorination apparatus. The water from the lake enters through 12 ports 6 feet by 6 feet in size, each provided with gates 6 feet above the bottom of the lake and 20 feet below the ordinary lake level. A 12-foot shaft located in the center of the structure carries water to the 12-foot arched intake conduit which is driven through limestone rock and has an 18-inch concrete lining. Water enters this shaft from the interior of the intake through four gates each 5¼ feet by 6 feet in size. This conduit carries the water to the shore where it is intercepted by a second shaft, from which part of the water flows to the Porter Avenue pumping station and the rest is carried by a 9-foot tunnel to the Massachusetts Avenue pumping station. Since the completion of the Emerald Channel intake, the use of the old or Massachusetts Avenue intake has been abandoned and it has simply been held in reserve.

The Massachusetts Avenue pumping station originally housed six 30,000,000-gallon vertical, triple expansion steam pumps, and two 25,000,000-gallon electric pumps. The electric pumps have been removed, and at present only one or two steam pumps are in use. Steam is generated by 16 horizontal tubular boilers of 300-h.p. each, and 4 water tube boilers of 600-h.p. each.

The Porter Avenue pumping station, which was put in operation in 1914, supplies most of the water used in the city at the present time. This station is one of the largest of its kind in the world, and houses five 30,000,000-gallon vertical triple expansion steam pumps, and space is provided for three additional pumps. Steam is furnished by eight 750-h.p. sectional water tube boilers, and space is provided for the installation of eight additional boilers. A meter room is provided in which there are five 48-inch Venturi meters, one for each pump. A valve system, in which all valves are hydraulically operated, is also installed in the station, and so arranged that any pump can be put on either service a few moments after notice.

Water is distributed by pumping through two zones, the high pressure and the low pressure zone. The pressure at the station on the high service

ranges from 80 to 90 pounds per square inch, and that on the low service line from 42 to 50 pounds per square inch. The high pressure system in general takes care of the newer section of the city, while the low pressure line supplies the older section. The daily water consumption during 1919 averaged 135,577,694 gallons or 263 gallons per capita, of which it is estimated that 98 gallons were used for commercial purposes. The distribution system consists of 620 miles of mains ranging in size from 1½ to 60 inches in diameter. There are 93,041 service taps, of which only 7.6 per cent are metered.

The Kensington water tower is located in the northeastern section of the city, and consists of a steel tank 40 feet in diameter and 85 feet in height, surrounded by an ornamental stone and brick tower. When filled to a depth of 75 feet the tower holds 705,000 gallons, and serves as a pressure equalizer on the high pressure service system. Prospect reservoir, located in the eastern part of the city, covers an area of 20 acres. When filled to a depth of 30 feet the reservoir holds 116,300,000 gallons, and serves as a distributing and pressure equalizing reservoir on the low service system.

Lake Erie, from which the public water supply of Buffalo is derived. is the fourth in the chain of Great Lakes and has a length of about 250 miles and an average width of about 45 miles. It has an average depth of 63 feet and an area of 10,000 square miles, with a total capacity of 17,500,000 million cubic feet which gives a storage capacity of about 1,000 days, assuming the average flow over Niagara Falls as 220,000 c.f.s. The total drainage area of Lake Erie is 24,000 square miles exclusive of the water surface of the lake. The axis of the lake extends in an east-northeast and west-southwest direction for its entire length.

Although there is a general drift eastward toward Buffalo, the water of Lake Erie does not move from one end to the other. This subject has been studied by the United States Weather Bureau, and their reports show the prevailing wind to be westerly. In addition to the wind, temperature changes influence the water movement in the lake as well as the discharge of streams entering the lake. The prevailing winds cause oscillations in the lake level. having an amplitude at times, at Buffalo, as great as 7 feet or more.

The waters of Lake Erie receive the sewage from a very large population existing on its watershed. It may be considered, however, that the streams entering the lake some distance above Buffalo do not appreciably affect the quality of the lake water, and it will be necessary therefore to consider only the nearby sources. These consist of the discharge of Buffalo creek, carrying the sewage of a portion of the city of Buffalo, and the flow of which at flood times amounts to nearly one-tenth of the flow of the Niagara river, together with the discharge of several other creeks discharging into Lake Erie along the south shore. The extent of diffusion of the waters of these streams and the direction which the diluted sewage takes depend upon so many factors that are indefinite that theoretical calculations upon the subject give but little satisfaction. Continued analyses, covering long periods of observation under many varying conditions, have shown that the water supply is fairly well protected against pollution by factors naturally tending to effect its purification consisting of dilution, sedimentation, sunlight aeration, and the natural death of the pathogenic organisms.

While extensive studies of the lake currents in the eastern end of Lake Erie have indicated that the water of streams carrying pollution and entering Buffalo harbor are deflected from the waterworks intake, the effects of floods and wind storms are unknown, and under these conditions water may be deflected to the waterworks intake. From data obtained during a study made by this Department in the month of March, 1920, for the purpose of determining the cause of excessive turbidity in the Niagara river water at certain times, it was shown that the lake water, which is usually clear and unaffected by the sewage from the city of Buffalo and Buffalo creek, is under the unusual conditions of heavy runoff or flood affected by these discharges. Under these conditions the effective operation of the chlorination

apparatus is the only source of protection for safety of the public water supply.

The city has no control over the steamers, scows, and fishing boats which, in carrying many thousands of people, pass near the waterworks intake and discharge the sewage from the boats without any treatment or restriction as to point of discharge. In addition, hundreds of fishermen go out on the ice during the winter, and the excreta from these people gives rise to another very great menace to the purity of the public water supply. The city must guard against these accidental sources of pollution by efficient operation of the chlorination apparatus.

The chlorination of the public water supply at Buffalo was first started in 1914, when a contract for the installation of such a plant was let to the Electro-Bleaching Gas Company of New York, and the plant completed and started in operation during August of that year. This chlorination plant is located at the Emerald Channel inlet pier, where it was in operation until the year 1919, when a new chlorination plant, especially designed by the Wallace & Tiernan Company, was installed. This provided for the application of liquid chlorine by means of a dry feed type Wallace & Tiernan chlorinator to the condensing towers of the old Electro-Bleaching Gas Company's machine, through which water flows from an elevated tank to the bottom of a shaft in the center of the intake pier. Water is raised to the elevated tank by means of a steam pump.

At the time of the inspection the engineer was informed that, due to trouble experienced in the operation of the chlorination plant through frequent stoppages of the overflow of the condensing towers, it is proposed to provide an injector for applying the chlorine solution to the water at the bottom of the intake shaft. It is stated that the injector will be of a special type so designed as to operate on as low a pressure as 5 pounds. This installation, however, will be of a temporary nature only, and it is proposed finally to locate the chlorination plant on the shore near the Porter avenue pumping station. Here it is stated the plans call for the application of the chlorine to the intake tunnel at a point 100 feet from the shore shaft of the tunnel.

As there are three separate lines leading from the shore shaft to the two pumping stations, it is very important that the application of liquid chlorine to the public water supply be evenly distributed. In this connection it should be pointed out that it is extremely difficult to distribute evenly the chlorine in a tunnel of this description unless a series of pipes could be installed across the diameter of the tunnel. This, however, cannot be done here as it is stated at times considerable anchor ice and slush enters the intake well and may possibly enter the tunnel leading to the pumping stations. The difficulty to be guarded against will be the accumulation of gas or chlorine solution at the top of the tunnel, where it will be slowly carried along to the shaft without becoming thoroughly mixed with the flow of water in the tunnel. It would therefore appear more practicable and afford a greater insurance of the even application of liquid chlorine to the public supply to arrange for its being applied in the separate intakes leading from the shore shaft. This matter, however, before being finally passed upon should receive further study, and if possible experiments should be carried on to show the actual movement of distribution in the pipe line.

The rate of application of chlorine to the public water supply ranges from 0.6 pound per million gallons during the winter when clear water is obtained, to 1.9 pounds per million gallons at times of wind storms when the water becomes quite turbid. The amount is regulated by a chemist who makes daily bacterial analyses as well as occasional chemical analyses.

From a study of the following table the effect of the chlorination of the public water supply upon the typhoid death rate beginning with the year 1915, when the chlorination plant was installed, can be easily seen. This amounts to a reduction from a death rate per 100,000 of 20.2 in 1910 to 6.6 in 1919.

Typhoid Death Rate in Buffalo for Ten Years Past

Year	*Population*	*Deaths from Typhoid*	*Rate per 100,000*
1910	423,715	86	20.2
1911	435,315	108	24.8
1912	444,915	50	11.2
1913	446,869	68	15.2
1914	454,112	72	15.8
1915	486,000	46	9.5
1916	495,000	51	10.8
1917	505,000	48	9.5
1918	505,000	37	7.3
1919	515,000	34	6.6

The prevailing winds at Buffalo come from the west and southwest and it is after the occurrence of a storm from this quarter that the bottom in the shallow harbor is stirred up, causing the public water supply to become turbid. During the year this condition is said to prevail from 10 to 15 per cent of the time. The sediment is quite heavy and settles rapidly so that after a storm has subsided the water quickly clears. During these storm periods, however, the water is decidedly unsightly and objectionable. This condition can be remedied only by filtration of the public supply.

In a report presented to the city council on February 4, 1920, by the commissioner of water this matter was discussed, and it was requested that the council authorize the commissioner to employ the aid of an expert to study this matter. The city should, therefore, consider at as early a date as possible the matter of the establishment of a filtration plant for treating the public water supply. In this connection studies should be made of the most desirable type of filter plant for Buffalo's particular needs, the most desirable site for the plant, together with a study of the conditions and changes of the lake water at Buffalo over an extended period of time.

At the time of the inspection samples of water were collected and sent to the Division of Laboratories and Research for analyses, the results of which are as follows:

Color	tr.	Oxygen consumed	1.2
Odor, hot	lv.	Chlorine	10.
Odor, cold	lv.	Hardness, total	93.8
Turbidity	15	Alkalinity	89.
Ammonia, free	.008	Bacteria per c.c. 20°C (liquefied)	.140
Ammonia, alb.	.068		
Nitrites	trace	B. coli type, 10 c.c.	0+3—
Nitrates	.100	B. coli type, 1 c.c.	0+3—
		B. coli type, 1/10 c.c.	0+3—

The results of these analyses show a moderately hard water having a slight color and some turbidity. The amount of nitrogen in its various forms indicates the presence of only moderate amounts of decomposing and decomposable organic matter. The oxygen consumed content is also moderate and the chlorine content is about normal for Lake Erie water. The results of the bacterial examination of the treated water show moderate total bacterial counts and the absence of organisms of the B. coli type. No sample of the raw water could be collected as the engineer did not make a trip to the intake pier at the time of the collection of samples, and therefore no data can be given on the matter of the effective operation of the chlorination plant.

As a result of this inspection it was recommended that the city authorities in charge of the public water supply continue their careful supervision of the public water supply in order that a supply of satisfactory sanitary quality may at all times be furnished to the consumers; that the waterworks officials

continue the water waste survey and immediately install meters in those districts where the survey has shown the waste to be greatest in order to reduce to a minimum the amount of water being pumped; that a careful study be made of the proper location of the chlorination plant on shore in order that the chlorine may be effectively and uniformly applied; and that since at certain times of the year the public water supply is rendered so turbid due to storms that treatment by chlorination alone will not produce a satisfactory supply, the city authorities should consider the matter of the filtration of their water supply; and that due to the magnitude and complex nature of the undertaking, the city authorities in charge of the water supply engage a water supply expert to study the conditions and advise them with regard to the desirability as well as the economy and practicability of installing a filter plant for the treatment of their supply.

CADOSIA

An inspection of the water supply of the village of Cadosia was made by Mr. W. J. Erickson, engineering assistant in this Department, on May 20, 1920.

Cadosia, a village of about 100 population, is located in the southwestern part of Delaware county, at the junction of the Scranton division and main line of the New York, Ontario and Western railroad. There are two sources of water supply: one, a spring, supplies the drinking water for the depot and the water for filling the drinking water tanks on the trains; the other, a small stream, the water of which is used at the restaurant in the depot and for filling the locomotive water tanks.

The spring is developed by the construction of a small wooden basin from which water is conducted to the depot through a 1½-inch iron pipe. The watershed above the spring has an area of about one-half of a square mile and is entirely uninhabited and uncultivated.

The brook supply is developed by the construction of a small dam across a stream about two miles east of the northern end of the freight yard. A 6-inch castiron pipe conducts the water to the village.

At the time of the inspection samples from both the spring and brook supplies were taken and sent to the Division of Laboratories and Research for examination. The bacteriological examination of the sample from the spring supply showed a high count, but bacteria of the colon type were absent in all of the inoculations tested. The water from the brook supply showed a very high count, and colon bacilli were found present in all of the inoculations tested.

As a result of the inspection it was concluded that the spring supply, if properly protected, should yield a water of satisfactory sanitary quality, but that the brook supply is subject to incidental contamination and not safe for human consumption without treatment.

It was therefore recommended that the brook supply be maintained in a satisfactory sanitary condition at all times, and that the use of the brook supply for drinking and culinary purposes in the restaurant be discontinued.

The water of this supply is used by the New York, Ontario and Western railroad for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on October 18, 1920, and included, in addition to the results of the analysis of a sample of the water the statement that at the time of the inspection the conditions surrounding the spring supply were satisfactory, and that the results of the inspection and the analyses of the samples indicate that the water from the spring is of satisfactory quality for human consumption. A copy of the report accompanied this data. Based on this information the United States Public Health Service on November 11, 1920, issued a certificate permitting the use of the water for drinking and culinary purposes in interstate traffic.

CALLICOON

A reinspection of the water supply of the village of Callicoon was made on June 15, 1920, by Mr. W. J. Erickson, engineering assistant. A previous inspection of this supply was made by this Department in 1916, the report upon which is published in the Annual Report of the Department for that year.

Callicoon is an unincorporated village of about 500 inhabitants, and is located on the Delaware river in the town of Delaware, Sullivan county, N. Y. It is on the main line of the Erie railroad about 48 miles northwest of Port Jervis. Approximately 90 per cent of the inhabitants are served with water from the public supply, which is owned and controlled by the Callicoon Water Company.

The supply is derived from two springs located northeast of the village and is conducted by gravity to the distribution system on which there are about 80 service taps, 12 of which are metered. The excess over consumption is stored in an equalizing reservoir located north of the village, which maintains a pressure of about 70 pounds per square inch in the main parts of the village.

The farther spring, known as the Bleckley spring, is located in the side of a rocky cliff about three-quarters of a mile northeast of the village. The supply issues from crevices in the bluestone formation. It has been developed by the construction of a masonry collecting chamber which is protected by a substantial wooden cover. The spring is not fenced or ditched, but the contour of the land above is such that the surface wash is conducted away from the spring. A small depression leading to a natural watercourse is located above the spring and it is possible that this may be the source of the supply. This area is not cultivated or used in any way. The area below, however, is used for pasturage. From the spring the water is conducted through a castiron pipe to a small concrete collecting basin located in the center of the field. The basin is enclosed by a wire fence 3 feet from it, and is provided with a substantial wooden hip roof.

The Anderson spring is located below the Bleckley spring. It, too, issues from the bluestone formation in the side of a wooded hill. It has been developed by the construction of a concrete wall and is protected by a wooden roof. The area around and above the spring is wooded and heavily covered with underbrush. The fence mentioned in the previous report is in bad repair, but the conditions are such that it is very difficult for cows or other animals to get near the spring. The third spring has been permanently abandoned.

The equalizing reservoir, which is about 60 feet square and about 15 feet deep, is of concrete construction and is provided with a substantial wooden hip roof. The concrete walls extend from 6 to 18 inches above the ground surface. Ditches conduct the surface wash away from the reservoir.

An auxiliary supply is obtained by pumping from a driven well located in the northwestern part of the village near the Erie railroad. It is driven through 6 feet of earth, sand, and gravel, 50 feet of clay or hardpan, 100 feet of blue sandstone, 15 feet of brown sandstone, 80 feet of red water bearing gravel, and 6 feet of gray sandstone, or about 256 feet total depth. The well is cased with an 8-inch casing for a distance of 63 feet or into the blue sandstone. Water rises to about 20 feet from the top of the well. A 4-inch suction extends to the bottom of the well. The pump house is located above the well.

About 100 feet from the well is a sewage disposal plant which serves some 50 people. It consists of a settling tank and a gravel filter. The effluent from the settling tank flows to the filter and leaches through the stone or gravelly soil into a ditch which discharges into a small brook flowing through a culvert under the railroad. The disposal plant appeared to be working efficiently at the time of the inspection. No plans of this sewage disposal plant have been submitted to or approved by this Department as required by law. The privy located 150 feet above the well has been cleaned since the previous inspection and appeared to be in a satisfactory sanitary condition. A number of houses are located above the well at distances from it ranging between 500 and 1,000 feet.

The land in the vicinity of the well is low, and it seems possible that at times of flood, pollution may be carried to the well from the disposal plant and from the stream flowing by the pump house. Judging from the general construction it does not seem probable that pollution enters the well under normal conditions. The location of the disposal plant is, however, a serious menace to the well supply.

The brook supply has been permanently abandoned.

At the time of the inspection samples were taken of the tap water and sent to the Division of Laboratories and Research for analyses, the results of which are given below. As the well supply was not in use, it was impossible to take a sample from this source.

Color	0	Oxygen consumed	.5
Odor, hot	none	Chlorine	1.0
Odor, cold	none	Hardness, total	22.1
Turbidity	0	Alkalinity	14.
Ammonia, free	.002	Bacteria per c. c.	50,000
Ammonia, alb.	.002	B. coli type, 10 c. c.	3+0—
Nitrites	absent	B. coli type, 1 c. c.	1+2—
Nitrates	.200	B. coli type, 1/10 c. c.	0+3—

These results show a water that is clear, colorless, and soft. The figures for nitrogen compounds in their various forms are low, except that for nitrates which is high, denoting that the supply has probably at some previous time received some organic pollution which has been rendered inert by passing through the ground. The high total count is probably due to some extent to the fact that the sample was delayed in transit. The presence, however, of organisms of the B. coli type in one of the three 1 c. c. samples denoted the presence of considerable active contamination. As rains had fallen steadily previous to the inspection, this may be due to the infiltration of surface water from the pasture lands around the spring.

In view of the above facts it was recommended that the Bleckley spring be fenced to exclude cattle from the immediate vicinity, and that proper precautions be taken at all times to protect the springs from pollution; that the present sewage disposal plant in the vicinity of the well be abandoned and another provided, plans for which shall be approved by this Department as required by law; and that all privies within 500 feet of the well be provided with water-tight containers and maintained in a satisfactory sanitary condition.

CANTON

A reinspection of the public water supply of the village of Canton was made by Mr. Earl Devendorf, assistant engineer in this Department, on July 8, 1920, a previous inspection having been made on June 29, 1919.

Canton is located on the DeGrasse river, in the central part of St. Lawrence county, about 60 miles north of the city of Watertown. The population is approximately 2,760, exclusive of the students, officers, and employees of the St. Lawrence University and the State Agricultural College, who number about 600.

The village is provided with a sanitary sewer system which discharges into the DeGrasse river a short distance below the pumping station formerly used to pump water from the river for the public water supply. This source of supply has not been used since January 1, 1919.

The present water supply is derived from seven springs connected to form two groups, one consisting of the Barrett, O'Brien, Allen, Matthews, and Dinsdale springs, and the other the Barriger and Coller springs. All the water from the springs is treated with liquid chlorine applied at the rate of 0.4 parts per million.

At the time of the inspection the conditions on the watersheds were practically the same as those described in the former report. The buildings

at the O'Brien and Allen springs have, however, been removed, and the village now owns and has just completed the erection of fences around the watersheds of all the springs, with the exception of a portion of the watershed of the Coller spring which has not yet been purchased. This area covers about 1½ acres and consists of a wooded pasture lot. The major portion of the watershed of this spring consists of muck land through which collecting channels have been dug to convey the water to the intake reservoir. The depth of the muck is said to vary from 3 to 6 feet. It is the intention of the village authorities to remove this muck, and for that purpose the village has purchased two Kopple cars and some 400 feet of industrial track. The watershed of the Barrett spring will at times receive the road wash of the little used dirt road. In the reservoirs of the Matthews, Coller, Dinsdale, and Barriger springs some algae growths were present. These growths are kept down, however, by the frequent use of copper sulphate. In this connection it would seem desirable that consideration should be given to covering these reservoirs to prevent growths of algae.

The village authorities have applied to this Department for the enactment of rules to protect the sanitary quality of their supply in accordance with the recommendations of the Conservation Commission when the permit was granted for the construction of the present supply.

The pumping station formerly used for pumping water from the DeGrasse river was at the time of the inspection still connected to the distribution system, and is separated from it by means of an 8-inch gate valve, the village authorities being reluctant to abandon the pumping station entirely because of the ever-present possibility of a break occurring in the main supplying the village when it would become necessary to provide an additional supply. If this pumping station is retained, the village authorities should remove the bonnets and gates of the two 8-inch gate valves on the discharge of the pumps, or take some other similar precaution to make it impossible for an unauthorized person to operate the pumping station and pump the raw water from the DeGrasse river into the village distribution system. The containers holding hypochlorite of lime to be used in the temporary sterilization plant provided at the pumping station had all broken open at the time of the inspection. In this connection it would be well to have a cylinder of chlorine kept constantly at the pumping station in order that the supply may be chlorinated if it should become necessary to use this source of supply.

As a result of the investigation the following conclusions were drawn:

1. That the previous recommendations of this Department have been carried out with the exception of the removal of the cross connection between the DeGrasse river pumping station and the village distribution system.

2. That the analyses of samples of water from the east line of springs indicate that these springs are subject to some contamination, probably of animal rather than human origin.

3. That, as is true of all surface supplies, the supply is subject to the local or chance contamination by trespassers upon the watershed.

4. That the Little river supply is subject to contamination by surface wash.

It was therefore recommended:

1. That the village authorities immediately sever the cross connection between the DeGrasse river pumping station and the village distribution system by removing the bonnets of the valves on the discharge lines of the pumps as pointed out above, or by removing a section of pipe from the discharge line.

2. That provision be made to treat the DeGrasse river supply with liquid chlorine before pumping into the village distribution system should occasion for its use ever arise.

3. That the village authorities purchase and fence the remaining portion of the watershed of the Coller spring.

4. That in view of the results of the recent examination the village authorities continue to operate the chlorination apparatus and treat the supply with adequate amounts of chlorine at all times.

5. That the Little river supply should in no case be used as an auxiliary supply without sterilization by means of liquid chlorine.

6. That as previously recommended the village authorities frequently flush all the dead ends of the distribution system.

7. That the village authorities consider the matter of covering the reservoirs of the various springs in which algae growth occur.

8. That when the water rules recently prepared by this Department and now before the Board of Water Commissioners of the village for their consideration have been enacted, the village authorities post the watershed and make frequent inspections to discover and remove any sources of contamination which may be found to exist.

CASTLETON

A reinspection of the water supply of the village of Castleton was made on June 3, 1920, by Mr. W. J. Erickson, engineering assistant. Previous inspections of this supply were made by this Department in 1912, 1914, and 1917, the reports upon which are published in the Annual Reports of the Department for the respective years.

Castleton, which is an incorporated village of 1,583 inhabitants, is located on the east bank of the Hudson river, 9 miles south of Albany on the New York Central railroad. The supply is owned and operated by the village under the direction of the board of trustees. About 90 per cent of the population of the village uses the public water supply.

The supply is derived from Volkie kill by impounding the creek water in a storage reservoir located about 3 miles east of the village. The water is conducted by gravity through a distributing system consisting of about 11 miles of mains varying from 6- to 16-inches in diameter on which there are some 300 service taps, all metered. No data is available as to the consumption.

A concrete intake chamber is located at the side of the stream about 500 feet above the reservoir. A small rock dam serves to divert the water into the intake chamber. The main stream flows in its natural channel around the reservoir and carries the heavier sediment with it in times of heavy runoff. From the intake chamber the water flows to a small screen chamber 10 feet distant, and from there to either the reservoir or to a small storage chamber located below the reservoir.

The reservoir is about 2 acres in area and is quite shallow. Considerable trouble is experienced from algae for which the water is treated with copper sulphate. The reservoir was last cleaned three years ago. It is protected from surface wash by a 3-foot embankment.

The small storage chamber was constructed three years ago below the reservoir. It is formed by subdividing a concrete reservoir by a concrete wall so that a smaller reservoir is formed, 3 by 17 feet in plan and 12 feet deep, having a capacity of about 3,240 gallons. In summer the supply is taken mainly from this reservoir.

The watershed has an area of about 6 square miles, most of which is cleared and used for farming and grazing. The total population is about 200, or 33 per square mile. The upper half of the watershed is rather hilly while the area nearer the reservoir is more level. The soil is sandy gravel over shale and slate.

The sanitary conditions on the watershed are about the same as described in the previous report. Several highways traverse it and there are about 40 houses on it most of which are located well back from the stream and its tributaries. The Shufelt place mentioned in the previous report is about a mile above the reservoir on the Albany Post road. The hog-pen mentioned as being located 15 feet from the stream has been cleaned and abandoned. There is, however, a barn close to the stream and a manure pile located about 30 feet from the stream. With this exception there seems to be no serious

condition upon the watershed, although as it is a farming region there is considerable wash from farm lands at times of heavy rain.

The supply has been depreciated as to its aesthetic quality by bad tastes and odors. Considerable trouble has also been experienced by eels clogging the house pipes.

Samples of the village supply were collected at a tap in the village and sent to the Division of Laboratories and Research for analyses. The results of these analyses are as follows:

Color	trace	Oxygen consumed	1.4
Odor, hot	lv	Chlorine	1.6
Odor, cold	lv	Hardness, total	122.8
Turbidity	0	Alkalinity	104
Ammonia, free	.002	Bacteria per c.c.	60
Ammonia, alb.	.068	B. coli type, 1/10 c.c.	3+0—
Nitrites	.001	B. coli type, 1 c.c.	2+1—
Nitrates	.300	B. coli type, 10 c.c.	0+3—

The analyses show a water that is hard and at times very turbid and colored. The figures for ammonia compounds are fairly high, especially those for albuminoid ammonia, denoting the presence of some organic pollution probably largely of vegetable origin. The total counts are moderately high and the presence of B. coli in almost all 10 c.c. and 1 c. c. volumes, and occasionally in 1/10 c.c. volumes, indicates the presence of considerable active contamination of human or animal origin.

In view of these facts it was concluded that the recommendations of the previous report of this Department have not been fully carried out, and that the supply is subject to incidental contamination and pollution by surface wash and is not suitable for human consumption without proper treatment.

It was therefore recommended that the village authorities carry out the recommendations of the previous report of this Department regarding the installation of a filtration and sterilization plant.

CENTRAL ISLIP (State Hospital)

Plans for proposed extensions to the water distribution system of Central Islip State Hospital, Central Islip, N. Y., to serve additional quarters for acute patients, were submitted to this Department for approval by the State Architect, April 29, 1920, and after careful consideration by the Engineering Division were approved on May 3, 1920.

CHATHAM

A reinspection of the water supply of the village of Chatham was made on January 9, 1920, by Mr. Earl Devendorf, assistant engineer. Previous inspections of this supply were made by this Department in 1911 and 1918, the reports upon which are published in the Annual Reports of the Department for the respective years.

Chatham is an incorporated village of about 2,200 inhabitants, located in the north central portion of Columbia county, on the Stoney kill, a tributary to Kinderhook creek, 22 miles southeast of Albany.

The public water supply is owned by the village and operated under the direction of the board of trustees. There are two sources of supply, namely the Blinn and Palmer well supplies. The Blinn supply consists of 20 driven wells located about 1 mile east of the village. The Palmer supply, which consists of a dug well, is located below the village level and a short distance from Smith pond. From these wells the water is pumped to the village distribution system, and the excess over consumption goes to a reservoir 1 acre

in area located on a hill about ¼ of a mile north of the village and having a capacity of 4,000,000 gallons. The consumption varies from 300,000 to 350,000 gallons per day, of which consumers use 150,000 gallons per day, giving an average domestic consumption of approximately 70 gallons per capita per day.

At the time of the present inspection the Palmer well was in use and had been used continuously since July 16, 1919, at which time the contract with the power company for the operation of the pumping equipment located at the Blinn pumping station expired.

It has been planned to locate a new laundry about 300 feet north of the Palmer pumping station and near a large gravel pit located not far from the well. The engineer was informed that the wastes were to be discharged into the gravel pit, which at times when the pump is shut down is said to fill with water, indicating that the ground water at this gravel pit is tributary to the well. Under such conditions the laundry should not be located as proposed but at a point remote from the sources of the public water supply, and the wastes properly disposed of so as not to affect the ground water tributary to the water supply of the village.

In other respects the conditions of both pumping stations and the supply were approximately the same as described in the former report.

In view of these facts it was recommended that the village authorities continue as in the past to keep the grounds surrounding the wells in a clean and sanitary condition; to have frequent analyses made in order that the occurrence of any active contamination of the water supply may be discovered and eliminated; that another location be secured for the laundry other than that proposed near the Palmer well, care being taken so to locate the laundry and so to take care of the wastes discharged that there will be no opportunity for pollution of the ground water sources of the village water supply; and that, as previously recommended, a system of sanitary sewers be installed as soon as possible.

CINCINNATUS

A reinspection of the water supply of the village of Cincinnatus was made on June 4, 1920, by Mr. A. I. Howd, assistant engineer. Previous inspections of this supply were made by this Department in 1912, 1915, and 1918, the reports upon which are published in the Annual Reports of the Department for the respective years.

Cincinnatus is an unincorporated village located in the southeastern part of Cortland county, and has a population of about 500 people. It is on the Otselic river, and is the eastern terminus of the Cortland branch of the Delaware, Lackawanna and Western railroad, about 19 miles east of Cortland. The waterworks are in charge of a board of water commissioners.

The water supply is obtained from springs located about 2 miles southwest of the village, and a reserve supply is available from a well at the plant of the Reid Ice Cream Co. The water from the various springs is collected in a concrete basin from which it flows by gravity into the distribution system, the surplus over consumption going into a concrete reservoir 50 feet in diameter and 12 deep having a capacity of about 175,000 gallons. There are about 4½ miles of mains ranging from 3 to 8 inches in diameter and about 100 service taps of which approximately 95 per cent are metered. The water is not subjected to purification.

The recent inspection disclosed the fact that conditions remain practically the same as at the time of the previous inspection. No action has been taken by the authorities in charge of the water supply on our recommendations on the following matters: The construction of trenches above the springs, the raising of the masonry of the springs and catch-basins, and the fencing of an area around the springs to prohibit trespassing. The storage reservoir has not been covered to exclude sunlight and thus prevent algae growths. The cultivation of land above the springs, however, has been abandoned.

At the time of the inspection there was a small quantity of a green and brown scum on the surface of the water of the reservoir. A sample of the scum was collected and when later examined under the microscope was found to be an algae growth or aquatic plant, consisting of numerous types of Diatomaceae and Chlorophyceae. The water which had a greenish color is practically stagnant in the reservoir except during times of heavy draught, when the water enters the distribution system. Algae and other microscopic organisms grow most luxuriantly in still water and can develop in water in the presence of light. Better circulation in the reservoir might be provided by having the inlet pipe near the top on one side of the reservoir and having the outlet pipe near the bottom on the opposite side of the reservoir. It has been previously pointed out to the village authorities that the reservoir should be covered to exclude sunlight and thus prevent the growth of algae.

The result of the bacteriological analysis of samples of the water collected at the time of the inspection showed a fairly low total count, and the absence of organisms of the B. coli type in all the inoculations examined indicating that the water was apparently free from active contamination at the time the samples were taken.

In view of the above facts it was concluded that the village authorities have not carried out important recommendations of the previous report of this Department, that algae and other growths have occurred in the storage reservoir causing at times complaints of odors and tastes in the water, and that at times the water does not seem to flow readily through the pipe line from the springs to the village.

It was therefore recommended that the village authorities in charge of the public water supply of Cincinnatus be urged to carry out the previous recommendations of this Department that have not been acted upon; that the storage reservoir be covered, and if possible better circulation of water in the reservoir be provided; and that the village authorities consider the question of employing a competent engineer to investigate the matter of flow of water from the springs to the village.

COBLESKILL (Schoharie State School of Agriculture)

Plans for a water supply connection to serve the home economics building at the Schoharie State School of Agriculture at Cobleskill, N. Y., consisting of State Architect's drawing No. 2034, were submitted to this Department for approval by the State Architect on March 24, 1920. After careful examination of the plans by the Engineering Division they were approved on March 26, 1920.

COHOES

A reinspection of the water supply of the city of Cohoes was made on June 30, 1920, by Mr. Earl Devendorf, assistant engineer. Previous inspections of this supply were made by this Department in 1908 and 1918, the reports upon which are published in the Annual Reports of the Department for the respective years.

Cohoes is a city of some 25,000 inhabitants located 9 miles north of Albany on the Delaware and Hudson railroad, and on the Mohawk river at the site of the falls known as the Cohoes Falls. The public water supply is owned and operated by the city under a board of public works.

The water supply is obtained by pumping from the hydraulic canal furnishing power for the knitting mills. The water is pumped to a sedimentation basin located near the treatment works about 1¼ miles west of the city hall. From the raw water sedimentation basin the water flows by gravity through the filter plant and is distributed by gravity, except for that portion of the city lying west of the old Erie canal, which is supplied by pumping directly into the distribution system, the excess over consump-

tion going to the standpipe. This standpipe is located at the filter plant and is 25 feet in diameter and 50 feet high, having a capacity of 182,000 gallons. The consumption varies from over 8,000,000 gallons per day during the winter when the faucets are left open to prevent freezing, to about 6,000,000 gallons per day during the summer. This corresponds to per capita rates of 320 gallons and 240 gallons per day respectively. The raw water sedimentation basin has a capacity of 75,000,000 gallons, or approximately 10 days' supply. The storage reservoir for filtered water has a capacity of 12,000,000 gallons, or nearly 2 days supply.

The filter plant consists of 8 gravity mechanical filters having a total area of 2,640 square feet. The beds are underlaid with manifolds over which are perforated cap strainers having 3/64-inch openings. Over the strainer is 9 inches of graded gravel and 27 inches of Cape May sand. The water is held at about 3 foot depth over the sand. The filter run varies from 8 to 16 hours before washing, depending upon the character of the raw water being treated. The rate of operation varies from 90 to 130 million gallons per acre per day. The filters are washed with air and filtered water, the air being used for about 3 minutes at 6 pounds pressure and water being applied for approximately 3 minutes. The first filtrate is wasted for approximately 5 minutes or until clear. The average amount of wash water used for the period from January to June, 1920, as taken from the monthly record of operation, varied from 9 per cent to 1.53 per cent of the total volume of water treated.

The recent inspection was made as a result of word reaching this Department that a serious break had occurred in one of the water mains, necessitating the pumping of raw water into the distribution system. It developed that on account of the break in the 24-inch feeder of the water supply system on North Mohawk street it had been necessary to close down the filter plant and pump raw water into the city mains. The filter plant was closed down for a period from about 11 P. M. on June 26, 1920, to midnight, June 27, approximately 24 hours. During this time an emergency chlorination plant was installed in the Harmony Mills pumping station, and the water sterilized with hypochlorite under the supervision of Mr. James Caird, chemist and bacteriologist. During the period and for some few days after, the people were warned by notices printed in the public newspapers against using the water for drinking or culinary purposes without boiling. In this connection it would seem desirable that the authorities in charge of the water supply should consider the matter of installing such additional piping and valves as to provide dual pipe lines both from the pumping station to the filter plant and from the filter plant to the distribution system.

On January 1, 1920, the city authorities in charge of the waterworks engaged Mr. James Caird, chemist and bacteriologist of Troy, N. Y., to assume control of the operation of the filter plant. A representative of Mr. Caird's office makes daily visits to the plant, checking the operation and making tests for turbidity, color, alkalinity, and also bacterial counts and presumptive tests for B coli. Complete daily records are kept and monthly reports are made to the city authorities in charge of the public water supply.

On account of the shortage of alum, due to transportation difficulties, it has been necessary on different occasions to operate the filter plant without the application of alum. On two occasions, in March and May respectively, the hypochlorite plant has been out of order and the filtered water was not sterilized at these times.

Trouble from algae growths in the raw water sedimentation basin was experienced in the early summer months. These growths were mostly astrionella, and on June 17, 1920, copper sulphate was applied to the raw water sedimentation basin at a rate of 3½ pounds per million gallons, which has eliminated the trouble.

At the time of the inspection samples of water from various points were collected and sent to the Division of Laboratories and Research for analysis. The results of the analyses of the raw water show a moderately hard water having some color and turbidity. The figures for nitrogen in its various forms, oxygen consumed, and chlorine are high, and indicate the presence of

considerable organic matter, some of which is probably of animal origin. The results of the bacterial examination show high total bacterial counts and the presence of organisms of the B. coli type in inoculations as small as 1/10 c.c., indicating a grossly contaminated condition of the raw water at the time of the inspection.

The results of the analyses of the treated water show a removal of 100 per cent of the turbidity, 58 per cent of the color, 39 per cent and 21 per cent of the organic matter as measured by the albuminoid ammonia and oxygen consumed contents respectively. The percentage removal of bacteria was 87 per cent while the removal of the bacteria of the B. coli type was 100 per cent.

In view of the above it was recommended —

1. That the city authorities in charge of the public water supply continue to operate the water purification plant in a careful and efficient manner under the supervision of a competent chemist.
2. That the city authorities endeavor to maintain a sufficient supply of chemicals on hand in order that there be no interruption of the application of the chemicals.
3. That the algae growth occurring in the sedimentation basin be kept down by the careful application of copper sulphate under the supervision of a competent expert.
4. That consideration be given to the matter of installing such additional mains and valves as to provide a dual feed line from above the pumping station to the filter, and from the filter plant to the distribution system, in order that any future breaks in these mains will not necessitate the introduction of unfiltered water into the distribution system for public consumpton.
5. That the city authorities in charge of the public water supply consider the matter of an underground survey to discover and eliminate any large leaks, the installation of meters to cut down public waste, and a house to house survey to discover and remedy any service leaks, in order that the present filter plant may not be overtaxed by the excessive consumption of water.
6. That if any further trouble is experienced with the present hypochlorite plant, the city authorities in charge of the public water supply consider the installation of apparatus in duplicate for applying liquid chlorine in order that there be no interruption in the sterilization of the public water supply.

COLLINS (Gowanda State Homeopathic Hospital)

Plans for a temporary or emergency auxiliary water supply to be used exclusively for laundry purposes at the Gowanda State Homeopathic Hospital, Collins, N. Y., consisting of State Architect's drawing No. 2006, were submitted to this Department for approval by the State Architect on December 11, 1920. After careful examination by the Engineering Division it was recommended that the plans be approved, with the understanding that the proposed auxiliary supply be abandoned whenever required or when a new supply becomes available; that the proposed force main be kept entirely separate from the distribution system; and that the piping be arranged so that there will be no opportunity for the use of this temporary supply for drinking or culinary purposes. The plans were approved subject to these conditions on December 14, 1920.

COLONIE.

An inspection of the water supply of the Colonie Shops of the Delaware and Hudson Railroad Company, located in the town of Colonie, Albany county, was made on May 10, 1920, by Mr. W. J. Erickson, engineering assistant.

There are at present about 1,000 persons employed at these shops. Besides providing these people with drinking water and water for use in toilets and wash-rooms, the supply is used for filling the drinking water tanks on the passenger coaches and diners of the Delaware and Hudson railroad. Very little of the water is used for other purposes, water from another source being available for boilers and other industrial uses. The consumption averages about 100,000 gallons per day, of which 2,500 gallons is used for filling the passenger coach tanks.

The supply is derived from a dug well located in a level area in the southeastern corner of the shop yard and near the freight yards. The well is 60 feet in diameter and about 43 feet deep, and was dug through about 20 feet of fill and top soil, 8 feet of clay, and 15 feet of sand and gravel. It is from this latter layer that the water is derived. A concrete casing extends from the bottom of the well to about 2 feet above the ground level. The well is uncovered and debris was noticed floating on the surface of the water at the time of the inspection. The area in the neighborhood is used as a rubbish dump, but with this exception there are no permanent sources of pollution in the vicinity of the well.

The water is pumped to two storage tanks by two centrifugal pumps driven by 50-h. p. electric motors. These motors are housed in a small shed located over the suction well. The floor of this shed was oil soaked at the time of the inspection and the water from the tap flowed back into the well. The arrangement of the apparatus appeared to be only temporary. A Continental filter is located in the cellar of one of the shops. This filter was being by-passed on account of its inefficiency and insufficient capacity.

At the time of the inspection samples were collected from the well and a tap at the shops and the results of the analyses of these samples made by the Division of Laboratories and Research are as follows:

Color	5	Oxygen consumed	1.1
Odor, hot	none	Chlorine	14.
Odor, cold	none	Hardness, total	428.5
Turbidity	trace	Alkalinity	188.
Ammonia, free	.036	Bacteria per c.c.	90
Ammonia, alb.	.024	B. coli type, 10 c.c.	3+0—
Nitrites	.003	B. coli type, 1 c.c.	2+1—
Nitrates	1.00	B. coli type, 1/10 c.c.	0+3—

These results show a water that is very hard, slightly colored, and practically clear. The figures for nitrogen compounds are high, indicating considerable contamination by organic matter which appears to be of animal or human origin. The chlorine content is high for water of this district and also indicates pollution from animal or human sources. The bacterial counts are not excessive, but the presence of B. coli organisms in three of the six 1 c.c. inoculations indicates the presence of considerable active contamination.

As a result of the inspection it was recommended that the present well be abandoned as a source of supply and a new supply of safe sanitary quality be developed; that should it be necessary to temporarily retain the present well as a source of supply, it be improved by providing the well with a cover to prevent dirt and dust from blowing into it, by surrounding the well by a fence 30 feet from the well in order to prevent trespassers on this area, by discontinuing the dumping of rubbish within a radius of 250 feet of the well and by providing a water-tight floor for the pump house so that there will be no back flow into the well; that a careful analysis be made of the water after these improvements have been completed, and if active contamination is indicated, suitable apparatus be installed for the sterilization of the water, and liquid chlorine applied to the water in proper quantities continuously and at all times.

The water of this supply is used by the Delaware and Hudson railroad for drinking and culinary purposes in interstate traffic. Data regarding

this supply were furnished to the United State Public Health Service on October 21, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were not satisfactory, and that the results of the inspection and the analyses of the samples indicate that the water cannot be considered to be of satisfactory quality for human consumption. A copy of the report accompanied this data.

CONIFER

An investigation of the sanitary quality of the water supply of the unincorporated village of Conifer, St. Lawrence county, N. Y., was made by Mr. A. I. Howd, assistant engineer in this Department, on September 27 and 28, 1920, subsequent to an outbreak of typhoid fever in the village.

Conifer is a lumbering village controlled by the Emporium Forestry Company, located in the northeastern part of St. Lawrence county, in the town of Piercefield. The population is about 500. The village is provided with a sewer system which serves about one-third of the population. The sewage is discharged into a cesspool which empties into Dead creek. The remainder of the village is served with privies with earth vaults.

The principal source of water supply is springs and a spring brook about three-quarters of a mile east of the village. Water is also available from several dug wells in different parts of the village. These wells are generally from 3 to 4 feet in diameter and from 8 to 18 feet deep. A separate auxiliary water supply is obtained from Pleasant lake outlet and used solely for fire protective purposes.

The springs, the main source of the public water supply, are located in a swampy area near the foot of Arab mountain, and are developed by the construction of small wooden collecting boxes from which the water flows through a pipe line to the collecting reservoir. A small dam impounds the water of the spring brook, which is also conducted to the reservoir. The watershed adjacent to the springs and spring brook is small and unpopulated and apparently not subject to contamination from any permanent source. The Grasse River railroad passes about 15 feet from the brook at a point where the water is collected, and the brook is therefore subject to incidental pollution.

As a result of the investigation it was recommended that the wells in the village be abandoned, and that the springs and spring brook be developed and protected to provide a safe water supply for the community.

COXSACKIE

A reinspection of the water supply of the village of Coxsackie was made on November 7, 1919, by Mr. W. J. Erickson, engineering assistant. A previous inspection of this supply was made by this Department in 1912, the report upon which is published in the Annual Report of the Department for that year.

Coxsackie is located in the northeastern part of Greene county, on the west bank of the Hudson river. Part of the houses are served by public sewers, the remaining houses being provided with privies and cesspools. The waterworks are owned by the village and operated under the direction of a board of water commissioners.

The public water supply is ordinarily derived from a spring fed brook known as the Diep kill, the intake being located four miles northwest of the village. From the intake reservoirs of both supplies the water flows by gravity to the consumers through 8 miles of mains varying from 6 to 10 inches in diameter.

At times of drought it has been considered necessary to augment the upland supplies by direct pumping into the mains from the Hudson river

through a hose connection from the plant of the Upper Hudson Electric and Railroad Company. At these times warning notices have been published by the water commissioners advising the boiling of all water used for drinking or culinary purposes. The experience of this Department is, however, that such warnings, either through ignorance or carelessness, will usually be disregarded by a considerable proportion of the population. While there is no record of any outbreaks of typhoid fever resulting from this use of the river water, there is no question but that the practice is a most dangerous one, and one which might readily have disastrous consequences. The village, therefore, has been considering the construction of additional storage for the upland supplies to obviate the necessity of using the river water. Although bids on the construction were received this past spring, these bids were considered too high and the project has apparently been abandoned for the present.

About a quarter of a mile above the Diep kill reservoir there is a farmhouse. A privy is located in the rear of the house about 60 feet from the stream and about 40 feet from a tributary to it. This privy is not provided with a vault and excreta was noticed on the ground at the rear of the privy. Rubbish had been thrown on the bank of the stream. The field above the house is used as a pasture, and animal excreta was noticed at the edge of the stream.

About one-half mile from the reservoir there is another farm, the barnyard of which was not in a sanitary condition. A pigpen is located about 75 feet from the stream. There is a runway for cattle which extends to the stream and it bore evidences of animal excreta. The privy at the farm is provided with a wooden removable container and is located about 60 feet from the stream. It was stated that the container was removed once a month and the contents buried. The vault was full, however, at the time of the inspection. A short distance above this farm is a cow pasture located on both sides of the stream.

About three-fourths of a mile from the reservoir and at the intersection of the road alongside of the creek with a road from the south is another farm. The barnyard is located about 200 feet from the stream and was in a fair sanitary condition. In the field which extends on both sides of the stream a bull was tied, but otherwise it bore no evidences of being used for pasturage. Although time did not permit of a detailed inspection of all parts of the watershed, the above examples may be considered as typical of conditions at the various farms upon the area.

The Climax supply is derived from a subterranean stream formed by the Murderer kill which enters a sink hole about a quarter of a mile above the intake reservoir, this reservoir being located about 1½ mile northwest of the village. The reservoir is formed by a small concrete dam across the stream as it emerges from the foot of a steep cliff. The reservoir thus formed is consequently located in a cave in the cliff. The Murderer kill has a drainage area of about 6 square miles with a resident population of 270, or 45 per square mile. This watershed could not be covered in the time available for the inspection, but as it is located adjacent to the Diep kill watershed, the conditions thereon are probably similar to those on the Diep kill area.

At the time of the inspection samples were taken of the Diep kill supply, the Climax supply, and from a tap in the village, and sent to the Division of Laboratories and Research for analysis. The results of the analysis of the Diep kill supply showed a water that is moderately hard, highly colored, and at times turbid. The figures for nitrogen in its various forms were fairly high, showing the presence of moderate amounts of decomposing and decomposable organic matter. The figures for chlorine were above the normal for the region. The total bacterial counts were usually high, and organisms of the B. coli type present in the majority of 10 c.c. and 1 c.c. inoculations and occasionally in the 1/10 c.c. inoculations. The water from the Climax supply was similar to that from the Diep kill supply. The figures for nitrogen and oxygen consumed showed a water that contained considerable organic matter. The total bacterial counts were high, and B. coli were present in some inoculations as small as 1/10 c.c.

The analyses of the tap samples showed a supply of variable color and turbidity with moderate amounts of organic matter and of fairly high hardness. The bacterial counts were variable but usually high, and B. coli were more than moderately prevalent. These results indicated that the supply was actively contaminated at the time the samples were taken.

As a result of the inspection it was recommended:

1. That the village authorities make regular and thorough inspections of all parts of the watersheds of the Diep kill and Climax supplies, and that in accordance with the provisions of section 70 of the Public Health Law they secure the abatement of any violations of the rules and regulations found thereon.
2. That the village take steps for installing a modern filter plant, supplemented by sterilization, for the purification of the water supply.
3. That pending the installation of a filter plant, liquid chlorine apparatus be installed at once for the sterilization of the supply.
4. That in order to obviate the necessity for the occasional emergency use of the Hudson river, sufficient storage be provided for the present upland supplies or other streams if available be developed.
5. That until an adequate upland supply is secured, the village purchase apparatus for the proper sterilization of the river supply whenever it becomes absolutely necessary to resort to that source.

DAVENPORT

A reinspection of the water supply of Davenport was made on October 16, 1920, by Mr. W. J. Erickson, sanitary inspector. A previous inspection of this supply was made by this Department in 1915, the report upon which is published in the Annual Report of the Department for that year.

Davenport is an unincorporated village of about 300 inhabitants; it is in the northern part of Delaware county, about 12 miles east of Oneonta, in the Charlotte Creek Valley. Davenport Center, on the Ulster and Delaware railroad, and 5 miles west of Davenport, is the nearest railroad station. The water supply is owned and operated by the Davenport Water Company, about 200 use the water supply furnished by the company. There is no public sewer system in the village.

The supply is derived from four springs located about half a mile south west of the village. From these springs the water is conducted to a covered storage reservoir. From this reservoir the supply is delivered by gravity to the consumers through about one and a quarter miles of mains varying from 4 to 6 inches in diameter on which there are some 32 service taps, none of which are metered. The pressure in the village is about 65 pounds per square inch. The consumption is estimated at 12,000 gallons per day, or about 60 gallons per capita.

The springs are developed by the construction of four collecting wells. These wells have stone walls, concrete bottoms, and are covered with wooden roofs. The water enters through tile drains extending through the stone walls. Four-inch pipes conduct the water from the springs to the reservoir located just below the easterly springs. These effluent pipes rest on the bottom of the spring wells and are provided with castiron strainers having holes ½-inch in diameter. The reservoir is of concrete, 20 feet by 40 feet in plan and 10 feet deep, with a capacity of about 60,000 gallons. A substantial wooden roof covers the reservoir. A pipe extending perpendicularly from the bottom acts as an overflow. Earth banked around the collecting well and reservoir diverts the surface wash.

The watershed above the spring is about 15 square miles in area, though it is possible that about a square mile may contribute to the underground water feeding the springs. There are no houses on the watershed. The fields above the springs are used for pasturage and it is probable that some contamination reaches the supply from this source. A stream drains into the ground above the springs and it is probable that they are largely fed

from this source. Above the springs are outcrops of sandstone and shale while below are more or less impervious layers of sand and gravel.

The results of the analyses of samples of the water taken at the time of the inspection showed a water that is soft, practically clear, and colorless. The organic matter was moderate and probably largely of vegetable origin. The chlorine content was not excessive for waters of the section. The total bacterial counts were moderate. The presence of organisms of the B. coli type, however, indicated some active contamination.

From the results of the inspection it was concluded that the supply though subject to some contamination from pasture lands and from accidental or willful contamination of human origin may be considered to be of fair sanitary quality.

It was therefore recommended that the area surrounding the springs be fenced off to keep cattle and people away from the immediate vicinity, and that the watershed of the brook above the spring be abandoned for pasturing cattle, especially that portion along the banks of the brook.

DEFERIET and HERRING

An investigation of the water supply of the villages of Deferiet and Herring was made on August 1, 1919, by Mr. Earl Devendorf, assistant engineer.

Deferiet is an incorporated village of some 500 inhabitants located on the Black river, in the town of Wilna, Jefferson county, N. Y., some 2 miles east of Great Bend. The village authorities all work in the mill of the St. Regis Paper Company which is located there. The water supply is derived from two springs and six drilled wells, located in the village, from which the inhabitants carry water to their houses.

One of the wells known as Block well is situated on a level piece of ground some 500 feet back from the Black river and 75 feet distant from the nearest house. The water level in the river was some 40 feet lower than the ground surface near the well. This well is drilled to a depth of 70 feet through earth, quicksand, and hardpan, rock being encountered at a depth of 60 feet. A force pump is provided for raising the water; and a wooden cover which is not tight.

The School well is a drilled well located some 300 feet from the river and is said to be 67 feet in depth, all of which depth is reported to be through rock. A row of houses is located west of the well at a distance of approximately 100 feet.

The River well is located some 200 feet from the river, and the ground surface surrounding the well was some 40 feet above the water level in the river at the time of the inspection. A row of houses is located some 100 feet east of the well. This well is drilled to a depth of 40 feet, of which all but the first 8 feet is in rock.

The Railroad well is located between the highway and the railroad tracks, 100 feet from the nearest house. The land on the railroad side slopes toward the well. A wooden cover is provided which tends to deflect any surface wash. This well is only 40 feet in depth and all but the first 6 or 8 feet are in rock.

On the other or northern side of the railroad from the above described wells, there are two other wells known as the Bungalow and Italian wells. The Bungalow well is located on the top of a small incline in front of a row of small houses. A cesspool is located at the bottom of the incline at a distance of some 300 feet from the well. This well is drilled to a depth of 84 feet, of which all but the first 14 feet is in rock.

The other well is located in front of a block occupied by Italian workmen from which it has derived the name of Italian well. This block is served by privies, while the other houses and bungalows are provided with inside toilets which are supplied with the river water for flushing purposes. The privies are located in the rear of the houses and the nearest privy is at

a distance of some 150 feet from the well. This well is drilled to a depth of 60 feet, of which all but the first 14 feet is in rock.

As previously stated, there are two springs from which water is obtained for drinking and culinary purposes. One of these springs, known as the Bridge spring, is located along the bank of the river and is wholly unprotected from pollution, either by surface wash or by trespassers passing near the spring. At the time of the inspection human excreta were observed in the vicinity of the spring.

The other spring, known as the Mill spring, is located about 1,000 feet north of the mill. No sources of pollution were observed in the vicinity of this spring at the time of the inspection, and the analysis of the sample of water taken from the spring showed a low count and the absence of bacteria of the colon type.

Throughout this section of the country under consideration the land is almost all rock having very little soil covering. The prevailing rock material is limestone. Under the above described conditions the matter of putting down wells in the village, where cesspools and sewers are located, is attended with the danger of contamination from these sources. The wells, however, are all drilled 5 inches in diameter with casing constructed in rock in an attempt to prevent surface infiltration. Nevertheless, there is no assurance that pollution from the above described houses may not enter the ground water sources tributary to the wells through fissures at any time. The springs are wholly unprotected.

At the time of the inspection of the Deferiet water supply an inspection was also made of the well located at Herrings, where the St. Regis Paper Company maintains a hotel for its employees. There were approximately 100 persons living at the hotel at the time of the inspection.

The water supply is derived from a dug well located at the side of the hotel which was not satisfactorily covered or curbed, thus giving opportunity for surface wash to enter the well. A cesspool was located some 300 feet distant and at an elevation of approximately 30 feet below the ground surface surrounding the well. The nearest privy is at a distance of approximately 75 feet and at a lower elevation. There were no direct sources of pollution observed at the time of the inspection.

As a result of the investigation, it was recommended that the present sources of water supply for potable purposes of Deferiet and Herrings, derived from wells and springs subject to pollution, be abandoned, and that the company secure the services of a competent sanitary engineer to aid it in securing another supply for both Deferiet and Herrings which will be sufficient in quantity and of a proper sanitary quality for their needs for all purposes, and that the use of the river water in the houses be discontinued at the earliest possible time following the installation of a proper water supply system.

DEFREESTVILLE (Bottled Water)

An inspection of the sanitary condition of the spring and bottling works of the Morgan Spring Water Company at Defreestville, Rensselaer county, N. Y., was made on July 27, 1920, by Mr. Henry Ryon, assistant engineer, and Mr. W. J. Erickson, sanitary inspector, in this Department.

The spring is located a quarter of a mile north of Defreestville, and about 3 miles northeast of the city of Rensselaer. It is now owned by F. A. and W. A. Platt, who purchased it from the Morgan Spring Water Company a short time ago. About 500 gallons of water per day are delivered by the owners to their own customers, and about 1,000 gallons furnished to Mr. Wyle of Albany, who states that he distributes it under the name of "Ferndale Spring Water."

The water furnished to the offices in the capitol by Mr. Wyle is from this spring. The water is delivered in 5-gallon and 1-gallon bottles. The former are provided with wooden crates generally marked "Conservation Commission, State Reservation, Saratoga Springs," and the latter are shipped in

boxes containing six bottles marked in the same manner. In some cases the large bottles bear the seal of the State, blown on the glass, and the words "Conservation Commission, Ferndell Springs." It should be noted that the water formerly distributed by the Conservation Commission was "Ferndell Spring Water," while that now being distributed by Mr. Wyle is sold as "Ferndale Spring Water."

The spring is located about 500 feet west of the road and about 20 feet lower than it. It has been dug out and walled up forming a well about 4 feet wide and 8 feet long. The upper portion of the walls of this well is laid with cemented joints, while the lower portion is of dry rubble to allow the water to enter. The well is covered with a peaked wooden roof which is provided with a trap door. The ground in which the well is located slopes in such a way that the surface wash is diverted away from the well. A few feet east of and above the spring is a pump house equipped with a gasoline engine and is used to pump the water to the bottling plant through a 1¼-inch galvanized iron pipe.

The soil in the vicinity is apparently a residual soil underlain at no great depth with shale. Immediately east of or above the spring is a hay field extending for a distance of about 250 feet, and above this is a potato patch extending to the road. A stable belonging to the owner of the plant is located about 300 feet from the spring toward the road, and there is a privy just south of the stable. Both are on higher ground than the spring, but the topography of the ground is such that it seems improbable that any surface drainage from the stable or privy can reach the spring.

The room where the bottles are filled is about 10 feet by 15 feet in size and has a rough wooden floor. Two doors lead to platforms outside the building and a third leads to the kitchen of the adjoining dwelling. The water on reaching the bottling room passes through a Jewell pressure filter about 1 foot in diameter and 4 feet high to an elevated receiving tank over the bottling table. The filter is provided with an alum pot, but according to the statements of Mr. Platt no alum is applied. The filter is cleaned by reversing the flow, and the sand agitated by rakes operated by means of a hand lever. There are no records available to indicate how often sand is washed.

The receiving tank, located below the ceiling in the side of the bottling room, is about 10 feet long, 3 feet wide and 3½ feet deep, and is lined with galvanized iron. Its capacity is between 500 and 600 gallons. Three taps located on the under side of the tank are provided for filling the bottles. A rough table has been constructed under these taps, consisting of planks with open joints under a sink of galvanized sheet-iron which collects the water falling on it and discharges it into a drain leading to a cesspool about 40 feet west of the building which also receives the drainage from the floor.

No provision is made for thoroughly cleaning the returned bottles, and unless they are unusually dirty they are simply rinsed out and refilled. When they are not as clean as is desired a brush is used. No hot water or soap is used in cleaning them. It was stated by Mr. Platt, however, that he intends to install a steam boiler so that the bottles can be sterilized with steam before being refilled.

Samples were taken at the spring and the bottling taps at which the bottles are filled, and sent to the Division of Laboratories and Research for analysis. One five-gallon bottle and 2 one-gallon bottles of the water as delivered to the Capitol were also sent to the Division of Laboratories and Research for analyses. The results of the examination of these samples show a water that is clear, colorless, and hard. The figures for nitrogen as free, and albuminoid ammonia and nitrates are in general low, while that for nitrogen as nitrates is fairly high. This would seem to indicate considerable pollution by organic matter which has been largely oxidized and rendered inert by the natural processes of purification in passing through the soil. The total bacterial counts are moderate, but organisms of the B. coli type were present in all but 1 sample tested, denoting the presence of slight amounts of active contamination. As the B. coli were found in the samples from the spring and tap as well as in the samples of bottled water, it is apparent that the contaminated matter reaches the water in the spring and is not due entirely to

the handling of the water and bottles. It seems probable that the organic matter in the water is largely of vegetable origin, although some is undoubtedly of animal origin and derived from the cultivated and fertilized fields above the spring, and possibly from the barnyard. It seems probable also that the active contamination of the water as indicated by the presence of B. coli is from the cultivated fields and of animal rather than human origin, although it is of course possible that incidental pollution of the watershed by human beings may have occurred. In the case of the samples from the bottled water, it is very possible that the presence of B. coli may have been due to contamination of the bottles in washing and handling.

In view of the above facts it appears that the spring of the Morgan Spring Water Company while it receives no gross pollution is not located in an entirely satisfactory manner for producing a water of unquestionable purity, and at times receives active contamination, probably from the cultivated field above the spring; and that the method used for cleaning and refilling the bottles is not entirely satisfactory, as although the bottles are rinsed with cold water, no attempt is made to sterilize them or the stoppers.

DELANSON

A reinspection of the water supply of the village of Delanson was made on October 13, 1920, by Mr. W. J. Erickson, sanitary inspector. A previous inspection of this supply was made by this Department in 1916, the report upon which is published in the Annual Report of the Department for that year.

Delanson, which is an unincorporated village of about 400 inhabitants, is located in the southwestern part of Schenectady county, about 15 miles south of Schenectady. It is largely a railroad center, being the junction of the main line and a branch line from Schenectady and the north. The supply is owned and operated by the Duanesburg Water Company. There are no public sewers in the village.

The water supply is derived from two small streams tributary to the Normanskill. These streams are developed by the construction of dams across them, thus forming reservoirs. They are located 4 miles and 1½ miles respectively north of the village. From the upper stream the supply is conducted through a pipe to a stream where it runs in an open channel to a small intake well located 2 miles below the reservoir, from which it is conveyed through a pipe line to the lower storage or distributing reservoir.

From the distributing reservoir the supply is conducted by gravity through about 5 miles of water mains varying from 4 to 8 inches in diameter, on which there are about 30 service taps. Only the railroad supply is metered. There are about 150 consumers and the consumption is estimated at 17,000 gallons per day. About 300,000 gallons per day are used by the railroad. The average pressure in the village is approximately 60 pounds per square inch.

The upper reservoir, developed by the construction of a long dike or dam across a stream, forms a rather narrow shallow reservoir of about 50,000,000 gallons capacity. It is filled with stumps and is evidently the bed of an old swamp. A spillway under the road passing along the dike allows the excess to pass off down the natural stream. From the reservoir the water is conducted through a castiron pipe for about a mile, thence in a natural channel to the intake well. This well is about 10 feet deep and about 4 feet square. The water enters the well through the open joints in the stone wall. Inside the well is a cylinder which is surrounded with a fine mesh copper wire, through which the water must pass before entering the intake pipe. From this intake the water flows by gravity to the distributing reservoir. This reservoir, which has a capacity of about 30,000,000 gallons, is in a better condition than the upper reservoir. The bottom appeared to have been recently cleaned and there was only a small proportion of marshy land at

the upper end. A fence surrounds the reservoir. A road, however, crosses the upper end.

There are about 2⅛ square miles of watershed tributary to the upper reservoir on which there are about 10 houses. The area tributary to the distributor is about a quarter of a square mile on which there is one house. This gives a total population of about 40 for the 2 watersheds, or about 15 per square mile. These houses are far removed from the reservoirs or tributary streams except as noted below. There is one farm located on the south side of the upper reservoir. The dwelling and privy are located on the downstream side of the dike and so the drainage is not toward the reservoir. The barn and chicken yard, however, are on the bank of the reservoir, and it seems probable that at times surface wash from these places as well as from the road reaches the reservoir.

The lower reservoir is subject to contamination which may reach it from the road crossing it and to pollution from chance visitors in the vicinity. The water is rendered very turbid at times of heavy rainfall.

At the time of the inspection samples were collected and sent to the Division of Laboratories and Research for analyses, the results of which are as follows:

Color	20	Oxygen consumed	8.2
Odor, hot	1a	Chlorine	.4
Odor, cold	1a	Hardness, total	36.4
Turbidity	3	Alkalinity	35.5
Ammonia, free	.002	Bacteria per c.c.	175
Ammonia, alb	.136	B. coli type, 10 c.c.	2+1—
Nitrites	Tr.	B. coli type, 1 c.c.	1+2—
Nitrates	.08	B. coli type, 1/10 c.c.	0+3—

These results show a water that is moderate in hardness, slightly colored, and turbid. The ammonia content and oxygen consumed indicate some organic contamination which appears to be largely of vegetable origin. The chlorine is only slightly above normal for water in this section. The total bacterial counts are moderate. Organisms of the B. coli type indicate the presence of some active contamination.

As a result of this investigation it is recommended:

1. That regular inspections of the watershed be made to detect sources of contamination, and all unsatisfactory conditions discovered be immediately corrected and proper precautions taken to prevent their recurrence.

2. That should any difficulty be experienced in carrying out the foregoing recommendations, the company apply to this Department for the enactment of rules and regulations for the protection of the sanitary quality of the supply.

3. That in view of the possibility of accidental or willful contamination by residents or visitors on the watershed and by surface wash from the road across the lower reservoir, the water company immediately install and put in operation a suitable chlorination plant, and consider the installation of some modern plant for further safeguarding the sanitary quality of the supply.

4. That the water company consider the re-location of the road around the lower end of the distributing reservoir and thus remove a dangerous source of contamination.

The water of this supply is used by the Delaware and Hudson railroad for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on November 15, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were not entirely satisfactory, and that the results of the inspection and the analyses of the samples, together with

the result of previous inspections and analyses, indicate that the water was not of entirely satisfactory quality for human consumption. A copy of the report accompanied this data. Based on this information, the United States Public Health Service on November 17, 1920, issued a provisional certificate permitting the temporary use of the water for drinking and culinary purposes in interstate traffic.

DEPOSIT

A reinspection of the water supply of the village of Deposit was made on May 19, 1920, by Mr. W. J. Erickson, engineering assistant. Previous inspections of this supply were made by this Department in 1909 and 1915, the reports upon which are published in the Annual Reports of the Department for the respective years.

Deposit, with a population of 1,779, is located partly in the southwestern part of Delaware county and partly in the southeastern part of Broome county. Of the total population, about 1,500 are served by the public supply. The waterworks are owned by the Deposit Water Supply Company.

The water supply is derived from Butler brook, about 2 miles north of the village, and from a spring-fed reservoir about a mile farther north. Both the reservoir supply and brook supply are filtered through a slow sand filter. After passing through the filter the water is delivered by gravity through a distribution system consisting of about 8 miles of castiron pipe varying from 4 to 8 inches in diameter. There are no public sewers in the village: privies, cesspools, and the like being used.

The upper reservoir, with a storage capacity of about 90 days, is formed by an earthen dam at the head of a small valley. This reservoir is mainly spring-fed, no stream entering it although at times of heavy rains it receives considerable surface runoff. There are no sources of human pollution within 1,000 feet, though the field immediately above the reservoir is used for pasturage. The reservoir is fenced so as to exclude cattle from the neighborhood. From the reservoir the water flows some 1,500 feet through an open channel to a small masonry intake dam, from which it flows through an 8-inch castiron main to the filter plant. A road passes along the open channel.

The brook supply is developed by a masonry dam across the brook, forming a small reservoir. The excess flows through a natural channel past the filtration plant. The village owns considerable land around and above the filter plant and intake, and no pasturage or cultivation is carried on within this area. Above this the watershed is almost entirely cultivated or used for pasturage. There were no direct sources of human pollution observed at the time of the inspection, but as is the case of such districts there are many possibilities of contamination of the supply.

From this reservoir the water filters through a filter dike composed of gravel into the sedimentation basin, about 200 feet by 100 feet by 10 feet deep, and having a capacity of about 5,000,000 gallons. This basin has a gravel bottom and riprap sides. From the sedimentation basin the water is conducted to the slow sand filter. The filter which is about 500 feet by 100 feet is subdivided so that one section may be cleaned while the other is in use. The filtering medium consists of 1½ feet of sand and 1½ feet of graded gravel. The sand appeared to be rather poor quality and too coarse for a slow sand filter. The piping is so arranged that filtration may be carried on either from top to bottom, or *vice versa*. The average rate of filtration is about 300,000 to 400,000 gallons per day, or about 880,000 gallons per acre per day. The filter was not in operation at the time of the inspection as the sand had just been cleaned and renewed.

From the filter the water is conducted directly to the village, the excess going to a covered clear water basin with a capacity of 178,000 gallons. This basin is of concrete and is of circular form 50 feet in diameter and about 15 feet deep. It is covered with a wooden conical roof which is covered with

tar shingles. The clear water basin had just been cleaned and was practically empty at the time of the inspection.

Samples of the raw and filtered water were taken on November 8, 1920, and sent to the Division of Laboratories and Research for analyses. The result of the bacteriological examination is as follows:

	Raw	*Filtered*
Bacteria:		
Per c. c. 20°C	96,000	80,000
Per c. c. 37°C	4,900	1,900
B. coli type:		
in 10 c.c.	3+0—	3+0—
in 1 c.c.	3+0—	3+0—
in 1/10 c.c.	0+3—	0+3—

The results of the analyses show that the process of filtration produces practically no change in the chemical or bacterial content of the water, indicating a very low efficiency. The sand used is of a rather poor grade and is too coarse for use in a slow sand filter. It would seem advisable that this sand be removed, the underdrains cleaned of any growths or sediment that may aid in breeding bacteria, and a new sand of good quality and suitable size be used for the filtering medium. The sand should have an effective size of about .3 millimeter, and a uniformity coefficient of not more than 4. This bed should be about 3 feet in depth above the gravel layer which should be graduated in size, the larger sizes being placed around the underdrains.

As a result of the inspection it was recommended:

1. That regular inspections of the watersheds be made in order to detect and remove any source of pollution found thereon.
2. That the present filtering medium be replaced by a sand of suitable size and quality.
3. That the depth of filtering medium above the gravel be made not less than 3 feet.
4. That the underdrains be thoroughly cleaned.
5. That if the above improvements fail to yield a satisfactory effluent the supply be sterilized with liquid chlorine.

The water of this supply is used by the Erie Railroad Company for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on November 29, 1920, and included, in addition to the results of the analysis of a sample of water, the statement that at the time of the inspection the conditions surrounding the supply were not entirely satisfactory, and that the results of the inspection and the analyses of the samples, together with the results of previous inspections and analyses, indicate that the water cannot be considered to be of entirely satisfactory quality for human consumption unless the recommendations of our report are carried out. A copy of the report accompanied this data.

DOBBS FERRY (Palmine Company, Inc.)

An investigation of the water supply of the factory of the Palmine Company, Inc., at Dobbs Ferry, N. Y. was made by Mr. Alfred Mullikin, assistant engineer in this Department, on January 9, 1920, following a request of the factory officials for such an investigation.

The drinking water and water used for manufacturing cocoanut butter is obtained from two sources, one a spring located about 200 feet east of the factory, and the other a well about 100 feet deep located approximately 18 feet east of the New York Central railroad tracks and 17 feet north of the

factory. This well is known as Well No. 2. At the eastern end of the factory there is another well known as Well No. 1, which was not in use at the time of the inspection.

In view of the results of the inspection and the analyses of samples of water taken at the time of the inspection, it was concluded that the spring and well at the Palmine Company's factory were receiving active contamination from some source, and that these sources of water supply should not be used for potable purposes without adequate protection and purification.

It was therefore recommended that these sources be properly protected from contamination, and that the water be subjected to suitable treatment before being used, and that in view of the difficulty of properly purifying such a small supply the company consider the proposition of abandoning the present spring and well and obtain a supply of pure water from a more satisfactory source.

EASTHAMPTON

A reinspection of the water supply of the village of Easthampton was made on June 4, 1920 by Mr. Alfred Mullikin, assistant engineer. A previous inspection of this supply was made in 1915, a report upon which is published in the Annual Report of the Department for that year.

Easthampton is located in the town of Easthampton, on the Montauk branch of the Long Island railroad, about 115 miles from New York city. The population varies from 2,000 in winter to about 3,000 in summer. Of the total population, 99 per cent are served with water from the public water supply. The waterworks are owned and operated by the Home Water Company.

The water supply is derived from 5 driven wells located in the western part of the village near Cove Hollow and Bridgehampton road about 1/4 of a mile southwest of the railroad station. From the wells the water is delivered through a distributing system of about 14 miles of castiron pipe ranging from 2 to 10 inches in diameter. A steel standpipe 100 feet high and 13 feet in diameter, having a capacity of 100,000 gallons, is located about 100 feet west and slightly north of the plant. This standpipe takes the surplus and acts as an equalizing reservoir maintaining an average pressure in the municipality of approximately 30 pounds per square inch. Of the 400 to 500 service taps, only about 100 are metered. The average daily water consumption in winter is approximately 200,000 gallons, or 110 gallons per capita per day, while in summer, due to increased population, the sprinkling of lawns, etc., the average daily water consumption amounts to about 800,000 gallons, or 300 gallons per capita per day.

There are three 8-inch driven wells and two 10-inch driven wells about 117 feet deep. The 8-inch wells are situated in a brick pit having a depth of 24 feet and a diameter of 13 feet, which is provided with a concrete bottom. A small amount of leakage from the pumps remains upon the floor of the pit, but this is removed occasionally by a small rotary pump. The two 10-inch wells are located 40 feet and 80 feet respectively north of the pumping plant, and are connected by a 10-inch suction main which leads into the pump pit. These two wells are provided with cemented brick pits 8 feet in diameter and with depths of 20 and 24 feet respectively. The pits are provided with concrete covers. The strata through which the wells pass consist of 6 feet of sand and 6 feet of clay with the remaining distance of sand.

The pumping plant is located in a sparsely populated section of the village on a reserved area of ground amounting to about two or three acres. There are no direct sources of pollution in the vicinity of the wells. The nearest house, occupied by the attendant in charge of the pumping plant, is about 150 feet east of the wells. The toilet of the house is provided with a cement cesspool, the effluent from which is taken care of by subsurface irrigation. This cesspool is about 200 feet from the wells. There are no

other houses within 500 feet of the supply but all of the houses in the village are provided with either privies or cesspools as no sewerage system has been installed.

From the recent inspection it appears that the previous recommendations of this Department have been partly acted upon, in that a subsurface irrigation system has been installed to take care of the waste products from the nearest house, that the privy nearby has been abandoned, and that analyses of the water have been made yearly.

The results of the analyses of samples of the water taken at the time of the inspection showed a water clear, colorless, and very soft. The figures for nitrogen in its various forms with the exception of nitrates and for oxygen consumed were low, and indicated the presence of small accounts only of decomposing and decomposable organic matter. The value for nitrates was very high, indicating that considerble pollution had reached the supply but has been oxidized and rendered inactive by the natural process of purification in passing through the soil. The total bacterial counts were low, and the absence of organisms of the colon type indicated that the supply was free from active and dangerous contamination at the time of the inspection.

As a result of the reinspection of the public water supply of Easthampton it was concluded that the water supply at the time of the inspection was found to be of a reasonably satisfactory physical and sanitary quality, and accordingly recommended that the authorities continue their careful supervision of the supply.

EAST WORCESTER

A reinspection of the water supply of the village of East Worcester was made on July 15, 1920 by Mr. Earl Devendorf, assistant engineer. Previous inspections of this supply were made by this Department in 1910, 1915, and 1917, the reports upon which are published in the Annual Reports of the Department for the respective years.

The public water supply of the village, owned by the East Worcester Water Company, is derived from Oak creek, the intake being located about one mile north of the village. The village has a population of about 400, and approximately 75 per cent are furnished with the public water supply. The distribution system consists of approximately 2 miles of castiron mains varying in size from 4 to 6 inches in diameter. There are about 100 service taps. The total consumption is estimated at 90,000 to 100,000 gallons per 24 hours. The supply is filtered through a pressure mechanical filter located about one-fourth mile below the intake, this filter with the above estimated consumption, being operated at a rate of about 45,000,000 gallons per acre per day. In view of the fact that no storage is provided in the village, the above rate is undoubtedly doubled at times of maximum demand.

At the time of the inspection the alum pot at the filter plant was shut off and no alum was being supplied to the water. The superintendent stated that it had been shut off some 3 days previous with the idea that the complaints of objectionable tastes and odors might possibly originate from the application of the alum. The operator stated that normally he applies approximately 60 pounds of alum per batch, and that during the summer this would last some six weeks and during the winter much longer. At this rate, alum was being applied during the summer at the rate of about 1/10 of a grain per gallon, an entirely insufficient amount to give any satisfactory coagulation.

The conditions on the watershed are approximately the same as those described in the former reports, with the exception that all of the ponds except Bear Swamp pond have disappeared due to the washing out of the dams. The diverting wall at the north end of the reservoir was not tight and allowed brook water to enter the reservoir at this point. The intake well at the reservoir had been cleaned out during the week previous to the inspection.

On the day of the inspection the engineer examined the water drawn from the tap at the residence of Mr. George Jennings and Mr. James O. Van Buren, when a very pronounced fishy taste and odor was detected. Mr. Van Buren stated that the fishy taste and odors were first noticed during the last week in June. In the reservoir, which is approximately 250 feet in diameter and 10 feet in average depth, and contains some 3½ million gallons of water, algae were found which were mainly spirogira, an organism easily susceptible to treatment by copper sulphate. The engineer at the time of the inspection advised the superintendent to treat the reservoir with not more than 4 pounds of copper sulphate, or at the rate of 1.2 pounds per million gallons, and repeat if necessary until the algae had disappeared. The reservoir is said to contain trout, and care should be exercised in the application of the copper sulphate as trout are easily killed by this treatment. In general, it would be advisable to start early in the year with the application of the copper sulphate in order to prevent the growth of the algae rather than to wait until the growth appears before the treatment is begun.

At the time of the inspection, samples of water were collected and sent to the Division of Laboratories and Research for analysis. The results of these analyses show a moderately hard raw water having some color and turbidity. The amount of nitrogen in its various forms and the oxygen consumed content are high, indicating the presence of considerable amounts of decomposing and decomposable organic matter. The results of the bacterial examination show high total counts with the presence of organisms of the B. coli type in all of the 10 c.c. and 1 c.c. inoculations, indicating the presence of active contamination at the time of the inspection. The results of the analysis of the filtered water show a reduction in color and the removal of the turbidity. The amount of nitrogen in its various forms and the oxygen consumed content is apparently also somewhat reduced by the process of filtration. The alkalinity of the water is not reduced materially by the filter, indicating that the alum was being applied in insufficient amounts. The results of the bacterial analysis of the filtered water show high total counts and the presence of organisms of the B. coli type in inoculations as small as 1/10 c.c., indicating the presence of active contamination in the filtered water being delivered to the consumers in the village.

These results show that the filtration plant was not being operated in an efficient manner, and that alum was not being applied in sufficient quantity. Without the use of an adequate amount of alum, little coagulation is obtained and the proper results cannot be obtained.

As a result of the inspection it was recommended that the East Worcester Water Company immediately carry out the former recommendations of this Department; that alum be applied to the raw water continuously, and in sufficient quantities so that effective coagulation may be obtained for the proper operation of the filter plant; that the filter be carefully operated in order that a safe water may at all times be furnished the consumers; and that the algae growths be prevented by the judicious application of copper sulphate, care being taken in applying the chemical in order not to injure the fish in the reservoir.

ELIZABETHTOWN

A reinspection of the water supply of the unincorporated village of Elizabethtown, as supplied by the Elizabethtown Water Company, was made on September 5, 1919, by Mr. W. J. Erickson, engineering assistant. A previous inspection of this supply was made by this Department in 1915.

Elizabethtown, with a population of 550, is located in the northern part of the town of Elizabethtown, in Essex county. It is about 7 miles west of Westport, which is the nearest railroad station. The water supply is derived from springs located about two miles west of the village. The water from the springs flows either directly to the reservoir or to a small collecting basin formed by a concrete dam across a small brook. From the reservoir

it flows by gravity to the consumers through 6 miles of mains varying from 5 to 6 inches in diameter. There is no public sewer system, the method of disposal being privies, septic tanks, and cesspools. There are, however, a few private sewers which discharge into brooks flowing through the village.

The water supply system is derived mainly from five covered springs and a collecting gallery. From these springs and collecting gallery the piping is so arranged as to conduct the water either directly to the storage reservoir or to the small collecting reservoir formed by the damming of the small spring fed brook. The water usually flows directly to the storage reservoir, the excess flowing to the brook reservoir. The gate valve from this brook reservoir was only partly open, it being stated that it was used only at times of drought. It was also stated that in times of heavy rains, or when there is danger of pollution from surface wash, this valve is closed altogether and the supply comes solely from the springs. The watershed tributary to the brook is about one-eighth square mile in area and is uninhabited. A road passes through the gully near the stream and there is a possibility that surface wash may enter the brook from this road. The fence surrounding the brook reservoir and springs was in bad repair. The storage reservoir is of stone masonry and has a timber roof. It is 30 feet by 70 feet by 10 feet deep and has a storage capacity of 125,000 gallons.

From the above facts it was concluded that the springs are apparently free from any permanent sources of pollution and should furnish a safe supply, but that the brook supply is subject to contamination by animals and chance visitors on the watershed.

It was therefore recommended, as previously recommended, that the brook reservoir and springs be fenced by a woven-wire fence so as to exclude all trespassers, that the woods road near the brook reservoir be abandoned, and that the present supervision of the watershed be continued in order to prevent the occurrence of any pollution of the water supply.

ENDICOTT

A reinspection of the public water supply furnished to the villages of Endicott and Union, Broome county, N. Y., by the Endicott Water Works Company which is under the control of Endicott-Johnson Company, was made by Mr. Alfred Mullikin, assistant engineer in this Department, on March 26, 1920, a previous inspection of the supply having been made by this Department in 1916.

Endicott is a village of 15,000 inhabitants, located in the southern part of the town of Union, 8 miles west of Binghamton. Union, with a population of 3,400, is immediately adjacent to the western boundary of Endicott.

The water supply is derived from wells and delivered by pumping through a distributing system consisting of 25 miles of castiron pipe in Endicott and about 5½ miles of castiron pipe in Union. Three steel tanks, each having a capacity of about 1,560,000 gallons, take the surplus and act as equalizing reservoirs.

The wells consist of nineteen 6-inch driven wells, 150 to 200 feet deep, located in the southwestern part of the village, on the northern bank of the Susquehanna river. The water is pumped from the wells by air lifts and flows to the receiving tank, from which it is pumped into the distribution system. The land surrounding the wells is swampy, but drains have been laid which improved the condition to some extent. At the time of the inspection there appeared to be no permanent source of pollution in the immediate vicinity of the wells. The main trunk sewer from the village of Endicott, however, passes within 200 feet of the wells. This sewer is 48 inches in diameter and 20 feet deep. It was said to be of monolithic reinforced concrete construction.

The results of the analyses of samples of water taken on May 11, 1920, showed a water slightly turbid, colorless, and hard. The figures for ammonia

were low and indicated the presence of small amounts only of decomposing and decomposable organic matter. The total bacterial count was very high for a well water but the absence of bacteria of the colon type seemed to indicate that the supply was free from active contamination at the time the sample was taken.

As a result of the present inspection it was concluded that the water supply was of relatively satisfactory sanitary quality, and it was accordingly recommended that the authorities in charge of the supply continue to exercise careful supervision over the area in the immediate vicinity of the wells to prevent any pollution of the soil, and to see that at times of high water in the river no surface water enters the wells.

FARMINGDALE

A reinspection of the water supply of the village of Farmingdale was made on June 9, 1920, by Mr. Alfred Mullikin, assistant engineer. A previous inspection of this supply was made by this Department in 1915, the report upon which is published in the Annual Report of the Department for that year.

Farmingdale is located in the southwestern part of the town of Oyster Bay, on the main line of the Long Island railroad, about 32 miles from New York city. The present population is estimated at 2,200 and some 90 per cent are served with the water from the public water supply. The waterworks are owned and operated by the municipality under the direction of the village authorities.

The water supply is derived from three driven wells located in the eastern part of the village along the Long Island railroad tracks, about 1,200 feet east of the depot. From the wells the water is pumped into steel storage tanks and is forced by air pressure through a distributing system of 6½ miles of castiron pipe ranging from 4 to 6 inches in diameter. The average daily water consumption throughout the year is approximately 60,000 gallons per day, or 30 gallons per capita.

Each of the three wells is 45 feet deep. One 8-inch well located east of the plant has a 6-inch suction main and is provided with a brick pit 8½ feet deep and 2½ feet in diameter. The pipes in this pit are water-tight. There is a similar well located in the same relative position west of the plant and which is provided with a brick pit 7 feet deep and 2 feet in diameter. These two pits are provided with conical wooden covers. The two wells are about 150 feet south of the railroad tracks. The third well, located south of the plant, is an 18-inch tile well provided with an 8-inch suction main. The well is provided with a concrete pit 7 feet deep and 3 feet in diameter. The tile extends slightly above the bottom of this pit, which is provided with a concrete slab cover.

The pumping station and wells are located in a sparsely populated area and there appears to be no direct sources of pollution of the water supply, with the exception of the possible surface wash from the railroad track and from a privy east of the pumping station and located about 50 feet from one of the wells. This privy is provided with a concrete vault which is cleaned but once a year. At the time of the inspection the vault needed cleaning. There are three leaching cesspools in the vicinity of the wells which take care of the waste water from the pumping machinery. Two of the cesspools are southwest of the plant and are located about 30 feet from the wells. They are respectively 7 and 8 feet deep and 6 and 8 feet in diameter. The third cesspool is on the east side of the plant and is 7 feet deep and 6 feet in diameter. It is not thought that these cesspools would be sources of pollution unless polluted wash water from the ground surface should at times enter them. The village is not provided with a sewerage system, most of the houses disposing of their sewage by means of privies and cesspools. Practically none of the buildings are located within 500 feet of the wells.

As a result of the above investigation it was recommended that the municipal authorities in charge of the water supply maintain a careful sanitary

patrol at all times to detect and eliminate if possible any sources of pollution which may exist; that all privies and cesspools within a distance of 500 feet of the wells and which have not been provided with containers or made impervious be taken care of immediately, to eliminate any possible sources of contamination of the water supply; and that the privy at the pumping plant receive special attention, be immediately and frequently cleaned, and the contents removed to a remote place for disposal.

FISHER'S ISLAND

A reinspection of the water supply of the village of Fisher's Island was made on June 25, 1920, by Mr. Alfred Mullikin, assistant engineer. A previous inspection of this supply was made by this Department in 1915.

Fisher's Island is located about 12 miles northeast of and at the extreme end of Long Island, about 7 miles southeast of New London, Conn. The winter population is estimated at about 400 and the summer population at 2,500. The total population is served with water from the public water supply. The waterworks are owned and operated by the Fisher's Island Water Company.

The water is derived from ponds and pumped to a concrete reservoir 50 feet in diameter and 25 feet deep, having a capacity of 368,000 gallons, from which it is delivered by gravity through a distributing system consisting of some 6 miles of castiron pipe. In general the details of the water system remain as described in the previous report. The only change which has been made since the last previous inspection is the addition of the chlorination apparatus. The ponds from which the supply is taken are two in number, located near the center of the island. The water is pumped into a concrete reservoir located in the western part of the village and flows by gravity to the consumers. There is no inlet or outlet to the ponds. The small pond is about 15 acres in area and contains 70,000,000 gallons of water. It is directly connected by a 10-inch castiron pipe to the large pond, which is three times its area. This pipe is provided with a valve which is only open during the summer, when the consumption is at maximum.

The watershed is about one-fourth of a square mile in area, and the authorities do not allow building construction on the grounds. There is one house some 500 feet or more away from the plant in which the attendant lives. All houses on the island are provided with cesspools having subsurface drainage. Between the two ponds a road extends connecting the eastern and western end of the island. Notices have been posted to prevent trespassers from polluting the supply. Some trouble has been experienced from the growth of algae in the ponds in the summer season, and copper sulphate has been used to kill these organisms.

The water is taken directly from the small pond through an 8-inch pipe which extends about 30 feet into the pond to a point where the water is about 10 or 12 feet deep. This pipe conducts the water into a brick receiving well 10 feet in diameter and about 24 feet deep, from which the pumps draw their supply. The water is chlorinated by a manual control solution feed Wallace and Tiernan chlorinator which was installed in January, 1920. It is set up in the northeast corner of the engine room. The chlorine is applied at the rate of 4.01 pounds per million gallons or about 0.5 p.p.m. A Fairbanks platform scale is used to check the weight of chlorine.

As a result of the reinspection it was concluded that the water supply was apparently of a satisfactory sanitary quality at the time of the inspection, and it was recommended that the water company continue to exercise careful supervision over the watershed area to detect and immediately eliminate sources of pollution, and to carefully operate the plant to secure effective sterilization of the water.

FREEPORT

A reinspection of the public water supply of the village of Freeport was made on May 19, 1920, by Mr. A. Mullikin, assistant engineer, a previous investigation of the supply having been made by this Department in 1915.

Freeport is located in the southern part of the town of Hempstead, about 25 miles from New York city. The summer population is estimated at approximately 15,000 and the winter population at about 12,000. Of the total population about 90 per cent are served with water from the public water supply. The waterworks are owned and operated by the village.

The water supply is derived from six driven wells located in the west central part of the village. From the wells water is pumped into a distribution system consisting of about 28 miles of castiron pipe ranging from 4 to 12 inches in diameter, the surplus going to a steel standpipe 20 feet in diameter and 125 feet high, having a capacity of 300,000 gallons. The average daily water consumption is approximately 504,000 gallons, or 41 gallons per capita.

The six driven wells from which the supply is derived are 10 inches in diameter and range in depth from 45 to 50 feet. They are about 45 feet apart and located west of the pumping station in a low depression about 250 by 500 feet in area, so that the drainage from immediate surroundings flows towards the wells.

The 1920 inspection disclosed the fact that conditions remained practically the same as at the time of the previous inspection, and that the general sanitary conditions in the vicinity of the wells were unsatisfactory.

It was therefore recommended in the report dated August 13, 1920:

1. That a complete sewerage system for the village be constructed in accordance with plans approved by this Department, and all cesspools and privies, particularly those in the vicinity of the wells, be abandoned, and the houses which they serve be connected with the sewerage system.
2. That until the sewerage system is constructed, all privies within 500 feet of the wells be provided with water-tight containers, and all cesspools within the same distance be made impervious; and that when cleaned the contents of the cesspools be carefully removed and satisfactorily disposed of in some remote place.

FULTON

A reinspection of the public water supply of the city of Fulton was made by Mr. Earl Devendorf, assistant engineer, on May 13, 1920, previous investigations of this supply having been made by this Department.

The city of Fulton has a population of 13,000 and is located in the southwestern part of Oswego county, on the Oswego river, and about 25 miles north of Syracuse. The public water supply is derived from four dug wells, located from one to two miles south of the city. Wells Nos. 1 and 2 are located near the pumping station, between the Oswego river and the state highway. Wells Nos. 3 and 4 are located approximately 1/2 mile farther south. The water from wells Nos. 2, 3, and 4 flows into well No. 1, from which it is pumped to the distribution system through about 34 miles of mains ranging from 4 to 20 inches in diameter, the excess over consumption going to a concrete standpipe 40 feet in diameter and 100 feet high, which has a capacity of 950,000 gallons. The average daily consumption is approximately 1,000,000 gallons per day.

At the time of the present investigation it was learned that the sewer line at the pumping station has not been replaced, and is constructed of tile pipe and located approximately 50 feet from well No. 1. The casing of well No. 1 has been raised so that it extends about 2 feet above the ground surrounding the well. All of the wells are covered and provided

with steel casings, and the ground surrounding the wells graded in such a manner as to prevent any surface wash from entering and causing any direct contamination of the well water. At wells Nos. 3 and 4, however, no fences have been provided, as previously recommended, and cattle were grazing in the field in which the wells are located. The barn buildings near well No. 3 are still in use and have not been removed, as recommended in our former report. The ditch at the foot of the river dike has been cleaned out by the State, and it was stated that no serious floods have occurred to cause the ground surrounding the wells to be inundated. There are no cross connections of auxiliary fire service supplies existing between the public mains and these auxiliary service mains. It was learned that the city is expecting to place a new 16-inch castiron pipe line extending from the pumping station to Broadway, a distance of approximately 9,000 feet. The cost of this improvement is expected to be approximately $75,000. In addition to this new main, it is also expected to replace several 1 1/2- and 2-inch service lines and connect them with other service mains in order to eliminate dead ends.

It was therefore recommended in a report dated June 30, 1920:

1. That the village authorities take immediate steps to carry out the former recommendations of improving the sanitary condition surrounding the wells by replacing the tile sewer line near well No. 1 with castiron pipe and so re-locating it that it will pass as far as possible from well No. 1; by the construction of a new water-tight well for the storage of condenser water from the river, locating this well as far as possible from well No. 1; by fencing in the land surrounding wells Nos. 3 and 4; and by the purchase of the barn buildings near well No. 3 and their abandonment for stabling purposes.

2. That in view of the complicated hydraulic problems connected with a detailed study of the water supply of this city, the city authorities secure a competent engineer to carry out such studies as may be found necessary to secure the final solution of the problem of securing an adequate and safe water supply for the city of Fulton.

GARDEN CITY

A reinspection of the public water supply of the village of Garden City, Nassau county, Long Island, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on June 10, 1920, a previous investigation of the supply having been made by this Division in 1915.

Garden City is a village located in the northern part of the town of Hempstead. The present population is estimated at 5,000, of which all are served with water from the public water supply. The waterworks are owned and operated by the Garden City Water Company.

The water supply is derived from dug and driven wells located about 1/4 of a mile north of the Long Island Railroad station, in a sparsely populated section of the village. From the wells the water is delivered by pumping into the distributing system consisting of some 22 miles of castiron pipe ranging from 4 to 18 inches in diameter. A steel standpipe 30 feet in diameter and 125 feet high, having a capacity of 660,000 gallons is located about 3/4 of a mile northwest of the main pumping station. This standpipe takes the surplus and acts as an equalizing reservoir maintaining an average pressure in the municipality of approximately 60 pounds per square inch. The daily water consumption amounts to 1,250,000 gallons in summer and about 1,000,000 gallons in winter, or 250 gallons per capita and 200 gallons per capita respectively.

Since the previous inspection an additional pumping plant has been added to the supply which is known as Plant No. 3, and was installed in September, 1918. This plant is located at the southwest corner of Cherry

Valley avenue and 13th street. There are three pumping plants in all. No. 1, the main pumping plant, is combined with the electric light plant and is located at the northeast corner of Cherry Valley avenue and 11th street; plant No. 2 is located at the southwest corner of Franklin avenue and 11th street; and plant No. 3 is located as mentioned above. The dug well at plant No. 1 is 50 feet in diameter and 34 feet deep. The depth of water from the surface of the ground at the time of the inspection was 25 feet. There is usually from 8 to 15 feet of water in the well. The water rises 14 feet in three hours, which figures approximately ½ million gallons per day. The well at plant No. 2 is 86 feet deep. This well has a steel casing 6 feet in diameter which extends 52 feet below the surface of the ground. At the bottom of this pit is a concrete floor 4 feet thick. The driven well at plant No. 3 has a 20-inch casing and 16-inch suction pipe which is driven to a depth of 90½ feet. The strata through which these wells pass is sand.

The village contains principally high class suburban residences, and practically all of the houses are connected to the sewerage system. In the vicinity of the wells the territory is sparely settled, and aside from one toilet about 25 feet south of the well which is connected by castiron pipe to the sewerage system, and one toilet 100 feet west of the well connected to the sewerage system by a tile pipe, there is no other evidence of a possible source of pollution of the water supply.

It was therefore recommended in a report dated November 22, 1920:

1. That all sewers within 500 feet of the wells be constructed of cast-iron pipe with lead joints.
2. That a careful sanitary patrol be maintained at all times in the vicinity of the wells in order to detect any possible sources of pollution, and that such possible sources when discovered be immediately eliminated.

GARNERVILLE

An investigation of the public water supply of Garnerville was made by Mr. Earl Devendorf, assistant engineer in this Department, on September 1, 1920.

Garnerville is an unincorporated village of some 400 inhabitants located in the eastern part of Rockland county, one mile west of the West Shore railroad station at West Haverstraw, 35 miles north of New York city. The waterworks are owned and operated by the Rockand Finishing Company.

The supply is derived by gravity from Minisceongo creek, after filtration through mechanical gravity filters and sterilization by means of liquid chlorine. The watershed of the creek above the point of the intake has an area of 18½ square miles. There is sufficient storage upon the watershed to give a minimum dry weather flow of approximately 5,000,000 gallons per day, as estimated by Hill & Ferguson, the consulting engineers. The country is very steep and rocky and for the most part sparsely settled. However, there are numerous houses located near the stream a short distance above the intakes. At Thiells, some 2 miles above the small ice pond from which the supply is taken, the effluent of the sewage disposal plant of the Letchworth Village institution is discharged into the stream.

The disposal plant at the institution, consisting of settling tank and sprinkling filters, settling basin, sludge tank and sludge bed, is at present treating the sewage of some 500 persons. It is contemplated, however, to have an ultimate population of 3,300 inmates at the institution, when the present disposal plant will be enlarged. At the present time arrangements are being made to install a chlorination apparatus for the sterilization of the effluent from the plant. The dilution factor from the sewage effluent being discharged into the stream is at the present time about 75, whereas with the ultimate population it will be approximately 10, as based upon the dry weather flow of the creek.

The water flows by gravity from a small ice pond having a capacity of about four million gallons, located a short distance above the factory of the Rockland Finishing Company, and flows thence by gravity to the coagulation basin and filters, and thence to the clear water well where it is sterilized by means of liquid chlorine. From the clear water well the water is pumped to the distribution system and the excess over consumption is stored in the elevated tank located on the hill south of the factory. The elevated tank has a capacity of 125,000 gallons. The consumption is estimated from speed tests on the pumps as approximately 225,000 gallons, of which 120,000 gallons are used for commercial purpose.

The filter plant consists of mixing tanks and constant head orifices provided in duplicate for the application of alum and soda ash, a coagulation basin having a capacity of 50,000 gallons or approximately 5 hours detention, two gravity mechanical filters installed by the International Filter Company, having a total area of 160 square feet, and a clear well having a capacity of 10,000 gallons. The filter plant is operated on the average of about 11 hours per day. The gauges at the time of the inspection showed a rate of operation of 250,000 gallons per day, or 68,000,000 gallons per acre per day, and a loss of head of approximately 8 feet. The beds are washed with filtered water once each day. The first filtrate for washing is wasted until clear. As the chemist in charge of the operation of the plant was absent on the day of the inspection, no information as to the percentage of wash water was obtainable. From the caretaker at the plant it was learned that approximately 24 pounds of soda ash and 80 pounds of alum are used each day. With the estimated daily consumption, this is equivalent to .75 grain per gallon of soda ash and 1.86 grains per gallon of alum.

The filtered water is sterilized by means of liquid chlorine as it enters the clear well. A Wallace & Tiernan Co. solution type chlorinator is provided in duplicate, and at the time of the inspection chlorine was being applied at the rate of one pound per 24 hours, or based upon the estimated consumption at a rate of .53 parts per million. Scales are provided for weighing the cylinders of chlorine and daily records are kept to check the operation of the chlorination apparatus. Daily tests are said to be made by the chemist in charge of the operation of the plant. These are said to consist of alkalinity and turbidity readings, total bacterial counts, and presumptive tests for the presence of bacteria of the B. coli type.

At the time of the inspection the matter of cross connection was taken up, and it was ascertained that there were two cross connections between the new distribution system and the mains of the Haverstraw Water Company. These cross connections are provided with double check and gate valves and drains, and are located in accessible pits or manholes in accordance with the plans approved by this Department for such cross connections.

As a result of the investigation, it was concluded that the former public water supply of Garnerville as furnished by the Haverstraw Water Company is not being used at present; that the water supply of Garnerville now being used is furnished by the Rockland Finishing Company; that Minisceongo creek, from which this water supply is derived, is subject to both direct and indirect pollution from a populated watershed, and in addition receives at present the unsterilized effluent from the disposal plant at Letchworth Village, situated at a distance of some two miles above the point of intake; that the public water supply is treated by means of a modern purification plant recently installed by the Rockland Finishing Company; and that at the time of the inspection the filtration and chlorination plants were being operated in an effective manner and were producing a water of satisfactory sanitary quality.

In view of the above facts it was recommended, in a report dated October 8, 1920, that the officials in charge of the purification plant continue to operate the same in a careful and effective manner, and make daily analyses of the raw and treated water for the purpose of controlling the operation of the plant in order that the production of a water of satisfactory sanitary quality may at all times be assured.

GLEN COVE

A reinspection of the public water supply of the city of Glen Cove, Nassau county, was made by Mr. Alfred Mullikin, assistant engineer, on June 14, 1920, a previous inspection of this supply having been made in 1913.

Glen Cove is located about 28 miles from New York city, in the northwestern part of the town of Oyster Bay. The present population is estimated at 10,000, of which 75 per cent are served with water from the public water supply. The waterworks are owned and operated by the Nassau County Water Company.

The water supply is obtained from 13 driven wells located in the southern part of the village, about ¼ of a mile southwest of the Glen Street railroad station. The water is pumped from the wells through a 10-inch force main about 1,600 feet long to a standpipe located on a hill. The standpipe is 25 feet in diameter and 120 feet high, having a capacity of 440,000 gallons. This tank takes the surplus and acts as an equalizing reservoir. The average daily water consumption in winter is 400,000 gallons, or 53 gallons per capita, while in the summer the consumption reaches 800,000 gallons per day.

In addition to the seven 10-inch driven wells, six new wells have been driven. Three of these are 6-inch wells from 300 to 350 feet deep, located just east of the pumping station. These three wells at the time of the inspection were under repair, the strainers having been taken out for cleaning. The other three wells are located northeast of the pumping station, 2 of them are 6-inch, 200 feet deep, and one 8-inch, over 450 feet deep. The three last mentioned wells were flowing at the time the inspection was made. The surface of the ground near the wells consists of sand and gravel. It is understood, however, that the deep 8-inch well passed through two clay strata before reaching the stratum from which its water is derived. The water company intends to drive three more 8-inch wells in the immediate vicinity.

The tops of the casings of the old wells enter brick cisterns fitted with wooden covers. These cisterns are provided with connections near the top which take care of the overflow from the wells when the pumps are not operating. The six new wells are not provided with cisterns. The casings of these wells, however, extend several feet above the ground.

Some 300 or 400 feet east and north of the pumping station and on a higher elevation, the village is thickly populated. A domestic sewerage system was constructed in the village in 1913 but apparently only about 50 per cent of the population are connected to the sewer system.

In a report on the previous inspection it was recommended that the covers over the cisterns be made to fit tight and be kept locked, but from the recent inspection it appears that these covers have not been securely fastened and locked.

It was therefore recommended in a report dated August 31, 1920, that the water company maintain at all times a careful sanitary patrol over the area in the vicinity of the wells, and that the water cisterns be properly covered and fastened to prevent accidental pollution.

GLENS FALLS

A reinspection of the public water supply of the city of Glens Falls was made by Mr. W. J. Erickson, sanitary inspector, on August 4, 1920, previous inspections having been made in 1910 and 1915.

Glens Falls is a city of about 16,500 inhabitants, located in Warren county, 60 miles north of Albany on the Hudson river. The water supply is derived from three catchment areas on the slopes of the Luzerne mountains, about 6 miles northwest of the city. The water collected from these areas is impounded in three storage reservoirs, from which it flows by gravity to the city through two mains, one 12 inches in diameter and the other 20 inches in diameter. An emergency supply is obtained by pumping from Halfway brook. The

distributing system consists of 29.94 miles of castiron mains. The total consumption is estimated at about 3,000,000 gallons daily, or 180 gallons per capita per day. The water system is owned by the city and is under the direction of the board of water commissioners.

The three watersheds from which the regular supply is obtained are all adjacent to each other. The two northerly ones drain into the Halfway brook and thence northeasterly into Lake Champlain, while the most southerly one drains into the Hudson river.

The northerly watershed is known as the Butler pond watershed. The supply is derived mainly from a shallow, swampy pond known as Butler pond, which is about three-quarters of a mile long and comparatively narrow. At the time of the inspection the water level was low and the bottom in the shallower portion was exposed. There was considerable decomposing vegetable matter in the pond, especially at the lower end, where the water had a fairly high color. From the outlet pipe of the pond the water flows in a natural turbulent mountain stream to the storage reservoir about a mile and a half below. This storage reservoir is formed by an earthen dam with a concrete corewall some 60 feet high, forming a reservoir of 130,000,000 gallons capacity. Several hundred feet below this dam is a small concrete distributing basin from which the supply is conducted in a 12-inch main to what is known as the upper junction, where the pipes from the three reservoirs meet.

The watershed of the Butler Pond creek, as it is called, is mostly wooded, hilly country with only a small portion under cultivation. The city has purchased considerable of the land on this as well as on the other watersheds and is reforesting them with white pine and spruce. Two farms on the Butler Pond watershed have been recently purchased by the city. Previous to this, however, they were provided with chemical closets by the city. There are now apparently no permanent sources of pollution on the watershed.

The central or the Wilkie watershed is developed by the construction of an earthen dam at the head waters of the stream. This dam forms a reservoir of about 55,000,000 gallons capacity and has an average depth of about 10 feet. The watershed above the reservoir is entirely wooded. The edges of the reservoir have been cleaned and are kept free from driftwood. The distributing reservoir is about 2 miles below the storage reservoir, from which the water is conducted to the junction with the mains from the other reservoirs through two 12-inch castiron mains. The distributing reservoir was working at the time of the inspection and the water was highly colored. The watershed is similar to that of the Butler watershed. A wood road, on which two lumber camps are located, passes along the stream to the storage reservoir. It was stated that no lumbering has been carried on during the past year. When these camps are used the city furnishes them with chemical closets and chemicals which are kept for that purpose.

The southerly reservoir is known as the Keenan reservoir. It is developed by an earthen dam which forms a reservoir of about 200,000,000 gallons capacity and floods an area of some 65 acres. The water flows over a rocky bed to a concrete distributing reservoir about a mile below the dam. Two small settling basins have been made along the stream by the construction of small masonry dams. From the distributing reservoir the water flows to the before-mentioned junction, from which the combined flow is conducted to the city through a 12-inch concrete-lined pipe and a 20-inch castiron main.

There are no permanent sources of pollution on this watershed though it is subject to some pollution, as is true of all three, from trespassers on the watershed. A road passes along the course of the stream, but is on the property of the city and it is planned to have this road abandoned. At present lumber is being hauled daily down this road.

All the reservoirs are being kept in a clean condition and the watershed is being cleaned and being reforested. Warnings have been posted on all watersheds.

The auxiliary supply has been developed by the construction of a small wooden diverting dam across the Halfway brook about 1 mile northwest of

the city. The water flows from this diverting dam to a small concrete suction basin from which it is lifted by a pumping plant and discharged into the mains,

The watershed tributary to the Halfway brook above the auxiliary intake is about 4.6 square miles in area. About 25 houses are located on this area, with a total population of about 100, or about 26 per square mile. The headwaters of the stream rise in the slopes of the Luzerne mountains, which are rugged and practically uninhabited. The Wilkie reservoirs are located on this portion of the watershed. The lower section of the stream flows through a flat farming and grazing section. About half a mile above the intake is a farm that is in an insanitary condition. Cows were being pastured in the field above the intake dam at the time of the inspection. Although no thorough inspection was made, it was evident that there is considerable opportunities for contamination from the pasturing of cattle along the stream and from chance visitors as well as the permanent residents on the watershed. On account of these possibilities for contamination of this supply it should not be delivered to the consumers without adequate sterilization.

It was, therefore, recommended in a report dated September 2, 1920, that the board of water commissioners install and carefully operate proper apparatus for the sterilization of all water delivered to the consumers in order to eliminate as far as possible the danger from accidental contamination, and that the board of water commissioners consider the installation of a filtration plant for the treatment of part or all of the supply, the same to be supplemented by aeration in order to remove the odors.

GOSHEN

A reinspection of the public water supply of the village of Goshen was made on August 12, 1920, by Mr. W. J. Erickson, sanitary inspector, previous inspections having been made by the Department in 1912 and 1915.

Goshen is an incorporated village located in the central part of Orange county, about 7 miles southeast of Middletown. Practically all of the 3,500 inhabitants of the village use water from the public supply. Many families use private wells for their drinking water supply on account of the bad taste and odors in the village supply. The waterworks are owned by the village and are under the direction of a board of water commissioners.

The water supply is derived from a small artificial lake known as Prospect lake, which is formed by a dam across a small tributary of the Wallkill river, about 1¼ miles south of the village. From this reservoir the water flows to the consumers through castiron and concrete pipes.

The village has had difficulty in obtaining a sufficient water supply from the present reservoir and has retained the services of consulting engineers to help them in remedying this condition. Mr. J. H. Fuertes, consulting engineer of New York city, presented a report in 1901, which concluded that the disagreeable tastes and odors were due to the drawing down of the reservoir, thus reducing the depth and even uncovering the bottom of the shallower portion which when exposed to the summer sun become covered with algae growths. He suggested a dam below these shallow portions which would keep this area covered at times of low water. He also concluded that the lack of sufficient water supply was due to the fact that the present system had been outgrown and that there was excessive waste through leakage in the water mains and from an abnormal rate of consumption. His other conclusions concerned the adoption of a new or additional supply.

In 1918 the village employed Mr. Ralph N. Wheeler, consulting engineer of New York. He recommended that the Burell tract, a small catchment area tributary to the reservoir, be further developed so as to obtain the maximum yield, and that the consumers be advised of the necessity of curtailing the consumption.

The reservoir, which has a normal capacity of about 110,000,000 gallons, was 8 inches above high-water mark at the time of the present investigation.

Although some algae were noticed at the lower end, they were not present in excessive amounts. The water in the reservoir was highly colored, and there was a distinct disagreeable odor noticeable from the water at the taps in the village. About a month ago the water in the reservoir was treated with copper sulphate. A small catchment area known as the Burell tract has been developed, and the water from this area is conducted to the reservoir by a 12-inch tile pipe.

There are five houses with a population of about 20 people on the watershed which has an area of 2 square miles. Only one of these houses is located on the watershed and the drainage from the barns and outhouses is away from the lake and onto another watershed.

Fishing is allowed on the reservoir by a permit issued by the water board. A general survey has been conducted to discover leaks in the pipe lines, and although there is still considerable waste, it has been materially reduced by the repair of the mains.

It was therefore recommended, in a report dated September 14, 1920:

1. That consideration be given to Mr. Fuertes' and Mr. Wheeler's reports, particularly those recommendations which deal with the conservation and development of the present supply and the development of a new additional supply.
2. That the reservoir be cleaned of organic growths and deepened in the shallower sections to minimize these growths.
3. That copper sulphate be systematically applied under proper supervision in order to prevent algae growths from developing.
4. That regular and frequent inspections be made of the watershed in order to detect and prevent any contamination of the water supply.
5. That no fishing be allowed on the reservoir.
6. That should difficulty be experienced in the carrying out of recommendations 4 and 5, the village authorities apply to this Department for the enactment of rules and regulations for the protection of the public water supply of the village of Goshen.

GOSHEN (High School and Public School)

An investigation of the proposed source of water supply for the High School and Public School at Goshen, N. Y., was made by Mr. W. J. Erickson, sanitary inspector of this Department, on August 19, 1920.

The High School building is located in the southeastern part of the village, on the west corner of Main and Erie streets, and the Grammar School about 500 feet northwest of the High School on the opposite side of Webster avenue. The total attendance of the two schools is about 600. For a year and a half prior to the time of the inspection there had been no drinking water at the schools because the fixtures from which it would be taken are shut off from the village supply on account of the disagreeable tastes and odors and the pupils have obtained their water from wells in the vicinity, all of which are unsatisfactorily located in the built-up portion of the village.

As a result of the inspection it was concluded that a water supply for drinking purposes at the schools, derived from shallow wells on the school property, would without question be unsatisfactory; that a supply derived from deep wells on the property might prove satisfactory, although the location of the property in the built-up section of the village would make it necessary to carefully and continuously watch the quality of the water for the presence of contamination, and also make it necessary to fence off a considerable area around the well, on which it would be necessary to prohibit trespassing of any kind; and that the use of water from the village supply would probably be the safest from a sanitary point of view, even though its use might be undesirable from an aesthetic viewpoint.

The filtering of the village supply would undoubtedly improve its quality to some extent but would probably not entirely eliminate the tastes and

odors, even if the filter were operated continuously and in a proper manner, It would seem desirable, if the city water is used, that the improvement of its quality be made by those in charge of the water supply rather than by filtration at the schoolhouse, and to this end it would appear advisable that the authorities in charge of the schools use their influence to have the recommendations of our report of September 14, 1920, carried out with as little delay as possible.

GOUVERNEUR

Reinspections of the public water supply of Gouverneur, St. Lawrence county, were made by Mr. Alfred Mullikin, assistant engineer, on January 28, 1920, and on March 18, 1920. Previous investigations of the supply were made by this Department in 1906, 1909, 1916, 1917, 1918, and 1919, and reports on these investigations are in the Anuual Reports of this Department for the respective years.

In the reports on the previous inspections it has been pointed out that the water supply of the village, which is derived from the Oswegatchie river, was objectionable, and that it was seriously contaminated by surface drainage and sewage discharged into the river from villages and hamlets located above the waterworks intake. Serious outbreaks of typhoid fever have also been attributed to the use of this water supply.

Pending the introduction of a new supply from another source, the village has purchased two Wallace & Tiernan chlorine apparatuses of the solution-feed type, which were put in operation about February 18, 1920. One chlorine apparatus is connected with each of the two suction mains. The general features of the present supply, except the chlorination plants, such as the pumping equipment and general arrangements of the system, have already been described in previous reports and will not be reviewed at this time.

At the time of the inspection it was found that although the chlorination apparatuses had been installed and connected up, they were not operating satisfactorily. Both of the devices were clogged and the rubber tubing leading from the solution chambers to the suction mains were stopped, so that very little if any of the chlorine was being applied to the water in the suction mains. The chlorination apparatuses, however, were immediately overhauled and placed in proper operating condition. They were so adjusted as to apply about .6 parts of chlorine per million parts of water treated, which was sufficient to produce a slight blue color by the starch iodide test. Instructions for the care and the operation of the chlorination apparatuses and for the making of starch iodide tests were also left with the operator.

There were seven cases of typhoid fever in the village, and although three of them were in one house and two of them might therefore have been contact cases, the other cases were scattered and would indicate that they were waterborne in their origin. It is significant that chlorine had probably not been properly applied for a considerable time, and that the contaminated river water had consequently been delivered to the consumer with little if any treatment.

It was, therefore, recommended in a report dated April 9, 1920:

1. That the village authorities take steps to provide for a new water supply of satisfactory sanitary and physical quality as soon as possible.

2. That pending the introduction of a new supply, the chlorination plants be operated with as great care and efficiency as possible, and that sufficient chlorine be applied to the water at all times properly to sterilize it.

3. That analyses and tests be made of the water, and daily records be kept as outlined in paragraph 10 of the instructions of the operation of liquid chlorine apparatus.

GREAT BEAR SPRING WATER

An investigation of the bottling of Great Bear Spring Water at Albany, N. Y., was made by Mr. Henry Ryon, assistant engineer in this Department, on August 14 and September 10, 1920.

The water is obtained from springs near Fulton, N. Y., and transported from that place to Albany in glass lined steel tank cars. From these cars it is run directly into the storage tank, and from this tank through the bottling machines into the bottles. It is stated that the storage tank and the piping connected with it are sterilized with live steam at frequent intervals and at least twice a month.

The one-half gallon bottles used for distributing the water when returned to the plant are first washed on the exterior by placing them in a tank of hot water containing revolving brushes, arranged in the shape of a hollow cylinder, which come in contact with the outside of the bottles. They are next taken to the machine for washing the interior, which machine was said to be equipped with a revolving brush and jet for cleaning the inside of the bottles. After being removed from the interior washing machine the bottles are inverted over jets of hot water which rinse the inside, and are then placed in boxes holding six bottles and are ready for refilling. The glass stoppers used in most of these bottles are washed in hot water before being replaced in the bottles. In some cases, however, cork stoppers were used. The corks used were treated with paraffin but not sterilized.

The five-gallon demijohns are treated in practically the same manner as the bottles except that the exteriors are washed by hand. A machine equipped with a rapidly revolving brush is provided for washing the inside of the demijohns, and a jet similar to these used for washing the two-gallon bottles is provided for washing the interior of the five-gallon demijohns. The demijohns are all provided with cork stoppers which were paraffined but not sterilized before being placed in the demijohns. The washing is done with city water which is heated by being passed through coil heaters in the bottling room. At the time of the inspection the temperature of this water was such that it could be easily borne by the hand. When the first inspection of the plant was made. the steam sterilizer provided was not being used because, as the superintendent of the plant stated, it had been impossible to secure enough coal to operate it.

The second inspection indicated that several changes were made in the operation of the plant. The machine for washing the inside of the one-half gallon bottles was in place and being used. The steam sterilizer was also in use and it was stated by the attendant that all the bottles and demijohns, the glass stoppers used in the bottles, and the corks used in the five-gallon demijohns and some of the two-gallon bottles, were being sterilized at a temperature of 220° F. before being used. A small incubator had also been provided, and it was stated that samples of the water were being tested daily by the presumptive method for the presence of B. coli.

The five-gallon demijohns are filled by placing them one at a time on a roller conveyor under manually operated single bottling taps provided for the purpose. The corks are placed in them by hand, and the cork and neck of the bottles and the cork covered with a paper seal. The one-half gallon bottles are filled by an automatic machine, which fills a case of six at a time. The glass stoppers or the corks which are used in some of the bottles are placed by hand, and the stoppers and necks of the bottles covered with paper seals similar to those used on the demijohns.

At the time of the first inspection samples of the water were taken from the taps used in filling the half-gallon bottles and five-gallon demijohns at the plant, from two of the five-gallon demijohns as delivered at the Capitol, and from one of the one-half gallon bottles as delivered at the Capitol. The seals of these bottles were unbroken prior to their being opened for taking the samples. A sample was also taken by the chemist of the Division of Laboratories and Research at the office of the Highway Division of the State Engineer's office from a bottle delivered there. Later, on September

20, 1920, after the changes in the operation of the plant outlined above were made, another set of samples was taken from the bottles delivered at the Capitol.

The results of the analyses of samples of the water taken at the time of the inspection in August indicated a moderate count for all samples, and the absence of B. Coli in those taken directly from the bottling taps and from the glass stoppered half-gallon bottles. Colon bacilli were however found in the 1/10 c. c. inoculations in all the samples taken from the five-gallon demijohns, indicating the presence of active contamination, which judging from the result of the inspection of the plant was probably due to carelessness in filling and closing the bottles. The results of the examination of the samples taken from the bottles delivered to the Health Department at the Capitol on September 20, 1920, after certain changes mentioned above were made in the operation of the bottling plant, indicate the absence of B. coli in all the samples tested, and a considerably lower count in the water from the half-gallon bottles. The count in the sample from the five-gallon demijohn was, however, if anything, slightly higher than those in the samples taken in August.

GREEN ISLAND

A reinspection of the public water supply of the village of Green Island was made by assistant engineer, E. S. Chase, on January 29 and February 2, 1920, previous inspections of this supply having been made by this Division in 1917 and 1918.

Green Island, an incorporated village of about 4,500, is located in Albany county, on an island in the Hudson river between the cities of Troy and Watervliet. Practically the entire population, together with some 1,200 additional in the town of Colonie, are served by the public water supply. The waterworks are owned and operated by the Green Island Water Supply Company.

The water supply furnished by this company is derived from an infiltration gallery located on a small island between the village and Troy. An auxiliary supply is derived at times from the Hudson river. From the infiltration gallery the water is pumped upon two units of gravity mechanical filters and the filtered water, after chlorination, is delivered to the village by pumping through a distribution system consisting of 12 miles of cast-iron mains. The average daily water consumption is approximately 360.000 gallons. Storage is provided by a 50,000-gallon clear water basin and by a 500.000-gallon equalizing reservoir.

During the extreme cold weather of the latter part of January and the first of February of the present year, it became necessary to augment the supply from the infiltration gallery by water from the Hudson river. Water from the river was used from January 15 until February 6, except on January 25 to 30. During this time when the supply was augmented by river water the amount of hypochlorite used for sterilization was materially increased, and was applied in such amounts as to give a marked test for excess chlorine, by the ortho-tolidin method, in samples of purified water taken from a tap at the pumping station.

In this connection it should be noted that in December, 1917, and January, 1918, it was found necessary to use the auxiliary river supply for several days, and that subsequent to this use of the river water a severe outbreak of dysentery occurred, followed by about twenty cases of typhoid fever. As a result of the investigation at that time, it was concluded that the outbreaks were due to the use of inadequately purified Hudson river water.

The equipment of the water company is in a poor physical condition and the entire plant needs a complete overhauling. In connection with the infiltration gallery it is very possible that by cleaning its yield would be increased and consequently the necessity for the emergency use of the river would be obviated. This gallery has not been cleaned since 1915, and at that time removal of accumulated silt materially augmented the yield.

The apparatus for chlorinating the supply is of the type used with hypochlorite, and is therefore less easily and satisfactorily operated than modern types of apparatus using liquid chlorine. It is probable that liquid chlorine apparatus could have been so operated at the time of the recent emergency as to have given adequate chlorination without causing taste and odors from an undue excess of chlorine.

The two filters are of the tub type, New York Continental-Jewell manufacture. The coagulation and subsidence occurs in the lower part of the tubs, the subsidence period amounting to about 15 or 20 minutes. As the pumping station is operated for about 8 hours daily, the rate of filtration during the period the filters are in service amounts to 115 million gallons per acre daily. To determine the efficiency of the purification plant weekly analyses are made by James M. Caird of Troy.

It was therefore recommended, in a report dated February 27, 1920, that the water company continue to operate the purification plant with care and efficiency; that the company investigate the possibility of increasing the yield from the infiltration gallery, either by cleaning, or possibly by increasing its length; and that, as previously recommended, liquid chlorine apparatus be substituted for the hypochlorite plant.

GREENPORT

A reinspection of the public water supply of the village of Greenport, Suffolk county, was made by Mr. Earl Devendorf, assistant engineer, on November 6, 1919, a previous inspection having been made by this Department in 1916.

Greenport is an incorporated village in the northeasterly part of Suffolk county, N. Y. The population consists of approximately 3,800 inhabitants. The water supply is derived by pumping from one new and four old dug wells west of the village. The daily consumption amounts to from 500,000 to 750,000 gallons, or 125 to 175 gallons per capita.

The recent inspection disclosed that conditions of the water supply have been changed in certain particulars since the time of the previous inspection. The supply has been augmented by the construction of a new dug well some 1,600 feet north of the old pumping station. The privy at the old pumping station has not been removed and an inspection showed the vault to be filled. This privy is located within 75 feet of the nearest well. The privy at the nearest house, some 400 feet east of the pumping station, has been moved to the farther side of the lot. In other respects the condition of the public water supply remains practically as before.

The new well is located near the highway, and is a dug well 15 feet in diameter and 30 feet in depth. Normally there is 16 feet of water in the well, but when pumping is started the surface of the water is lowered about 8 feet within an hour. The well is apparently free from sources of pollution with the possible exception of drainage from the highway. There are no houses within one-quarter of a mile of this well. At the time of the inspection the well was provided with a wooden curb and cover to prevent surface wash from entering. Water was first pumped from the well into the village distribution system about October 1, 1919.

A sample of water was collected from the new well and forwarded to the Division of Laboratories and Research for analysis. The results of the analysis follow:

Color	0	Oxygen consumed	1.6
Odor, hot	none	Chlorine	75.
Odor, cold	none	Hardness	45.7
Turbidity	0	Alkalinity	21.
Ammonia free	.070	Bacteria per c. c.	14.000
Ammonia alb.	.018	B. coli, 10 c. c.	3+0—
Nitrites	trace	B. coli, 1 c. c.	3+0—
Nitrates	.200	B. coli, 1/10 c. c.	2+1—

The results of this analysis showed a water clear, colorless, free from odor, and moderately hard. The somewhat high figures for free and albuminoid ammonia indicate the presence of moderate amounts of decomposing and decomposable organic matter. The results of the bacterial examination show a very high total count, and the presence of organisms of the B. coli type in nearly all of the inoculations examined indicated the presence of active contamination. This may in part be due to the fact that the well has been dug only recently and that the contamination from workmen incidental to construction had not entirely disappeared. Other analyses should be made, and if the results still show the presence of contamination, this source of supply should either be abandoned or sterilized before being pumped into the distribution system for public consumption The high chlorine contents of both well supplies are probably due to the influence of sea water.

In view of the above, it was recommended in a report dated March 3, 1920, that as previously recommended the privy at the pumping station be provided with a removable container, and a sanitary patrol be exercised to keep all the privies within a radius of 500 feet in a clean and sanitary condition; and that other analyses be made of the new well supply in order to determine if the contamination indicated by the recent analysis is permanent or temporary, and if permanent the supply should be first sterilized before being pumped into the village distribution system.

A second reinspection of the public water supply of the village of Greenport, Suffolk county, was made on June 7, 1920, by Mr. Alfred Mullikin, assistant engineer.

This inspection disclosed the fact that the privy located about 75 feet from the nearest well has not been removed and is in an insanitary condition but that the privy at the nearest house some 400 feet east has been removed about 300 feet farther east. In a report dated July 6, 1920, the following recommendations were made:

1. That the municipal authorities in charge of the water supply carry out at once such of our previous recommendations as have not as yet been acted upon: namely, that the privy at the pumping station and all other privies within 500 feet of any of the wells be provided with removable watertight containers and kept in a satisfactory condition, and that a sanitary patrol be maintained by the village authorities to make certain that the privies are always kept in a satisfactory condition.
2. That occasional analysis throughout the year be made of both sources of supply in order to determine whether or not the degree of pollution of the ground water is increasing and to detect any active pollution if present.
3. That should active contamination be at any time detected, the source be immediately determined and removed, or the contaminated well be abandoned, or the water supply properly chlorinated.
4. That the curbing of the old wells be raised and cemented to prevent the entrance of surface wash.
5. That the oil and waste water pit be abandoned, the water being carried off by extending a pipe line in the southern direction.

GREENWICH

A reinspection of the sanitary condition of the public water supply of the village of Greenwich was made by W. J. Erickson, engineering assistant, on December 12, 1919, a previous inspection having been made by this Department in 1912.

Greenwich is a village located in the southwestern part of Washington county. It occupies both banks of the Batten kill and is about 30 miles north of Troy. It has a population of about 2,700 of which 2,000 are served by the water supply. The waterworks are owned and operated by the Greenwich Water Company. The original waterworks consisted of a gravity supply from a reservoir formed by the damming of a small brook located about

2 miles north of the village. This reservoir is now used only for fire protection. The present main supply was developed about 25 years ago when a dam was constructed on Fly creek between Archdale and Easton station, about 3½ miles south of the village. From the reservoir formed by this dam the supply flows by gravity to the distribution system. An auxiliary supply is derived by pumping from the Batten kill, in the eastern part of the village.

Fly creek rises just north of Fly Summit, and flowing northerly empties into the Batten kill at Greenwich. The main tributary rises east of Cambridge and joins the Fly creek just above the reservoir. The total drainage area is about 6.0 square miles, on which there is a total population of about 250, or 42 per square mile. The Greenwich and Johnsonville railroad crosses the main stream at several points. Near the headwaters of the creek is the small hamlet of Fly Summit, with about 100 inhabitants. There are no direct sources of human pollution at this point, although the meadows adjacent to the stream are used for pasture as is most of the meadow land all along the stream. Below Fly Summit and about ¾ of a mile above the reservoir, is Archdale. There are several houses at this point, but they are about 300 feet from the stream. On the main tributary, which rises near North Cambridge, about one mile from the reservoir, is a small pond located on the farm of B. F. Waters. This pond is fenced and is used solely for ice cutting, and is said to be dry during the summer months. Care is taken to remove droppings from the ice, and the pond is protected by means of a wire fence. The farm yard extends to the edge of the pond and a manure pile was noticed about 100 feet from it. The privy is located about 250 feet from the pond. The watershed area of this stream is essentially the same as that of the main stream, flowing through cultivated pasture land.

The Batten kill has a drainage area of about 400 square miles, most of which consists of a sparsely populated farming region. The domestic and trade wastes from the villages have brought about a considerable pollution of the Batten kill. The stream is used at times of drought as an auxiliary to the regular supply. When used, this supply is sterilized with hypochlorite of lime. It is said that a measure full of the powder is added to a wooden vat and the resultant solution is fed to the intake pipe. No definite amount or rate of application could be obtained.

At the time of the inspection samples of water were collected from the Fly creek reservoir and from a tap in the village. The results of the analyses of these samples made by the Division of Laboratories and Research follow:

Fly Brook Reservoir

Color	10	Chlorine	1.6
Turbidity	0	Hardness, total	68.6
Ammonia, free	.012	Alkalinity	47.
Ammonia, alb.	.068	Bacteria per c.c.	1700
Nitrites	trace	B. coli type: 10 c. c.	3+0—
Nitrates	.500	B. coli type: 1 c. c.	3+0—
Oxygen consumed	3.7	B. coli type: 1/10 c. c.	0+3—

Tap in Village

Bacteria per c.c.	1200
B. coli type: 10 c. c.	3+0—
B. coli type: 1 c. c.	2+0—
B. coli type: 1/10 c. c.	1+2—

As a result of the inspection it was concluded that the water supply as derived both from the main and auxiliary sources was not of satisfactory sanitary quality for human consumption without proper treatment, and it was, therefore, recommended, in a report dated January 17, 1920:

1. That owing to the inadequacy and unsatisfactory quality of Fly creek as a source of public water supply, the water company consider the development of a new and adequate supply of satisfactory sanitary quality.

2. That should the Fly creek be retained as a main or auxiliary supply, the supply be subjected to some modern method of filtration, supplemented by chlorination.

3. That pending the carrying out of the above recommendations the water company install and properly operate apparatus for sterilization with liquid chlorine of both the present sources of supply.

4. That the officials of the water company cause frequent and careful inspection to be made of all parts of the watersheds used for public supply in order to detect and minimize the opportunities for dangerous pollution of the supply.

GUILFORD

A reinspection of the water supply of the village of Guilford was made by Mr. Alfred Mullikin, assistant engineer, on February 3, 1920, a previous inspection having been made by this Division in 1915.

Guilford is an unincorporated village with a population of about 350, located in the town of Guilford, Chenango county, 9 miles northwest of the village of Sidney.

The water supply is owned and controlled by the Moses Brothers' Water Company, and is derived, without purification, directly from a mill pond approximately 75 feet wide and 200 feet long, situated just below and adjacent to the outlet of Guilford lake.

Guilford lake has a drainage area of about 1¾ square miles and a water surface area of about 73 acres. The lake is fed by two small streams at the west end and by one from the north end, the latter being the larger of the three. There are also numerous springs in the bottom of the lake which probably constitute the main source of supply.

Paralleling the entire west shore line, about 50 or 60 feet from the water edge of Guilford lake, is the New York, Ontario and Western railroad. Between the railroad and the bank of the lake is a public highway. The lake is used extensively for boating, bathing, fishing, and ice cutting, all of which uses increase the unsatisfactory condition of this water for drinking purposes due to accidental, incidental, or willful pollution. Trouble is also experienced due to algae at certain seasons of the year resulting in disagreeable tastes and odors in the supply. There are about 14 cottages in close proximity to the lake, and in summer numerous campers occupy the shores. Four boathouses are located on the lake near the outlet back of the dam.

This dam is located directly underneath a highway bridge, and considerable surface debris falls through the wooden flooring. As the water enters the mill pond a large amount of churning of mud on the bottom of the pond is effected, requiring a long while for the turbidity to settle out. On the east bank, about 25 feet from the mill pond, is a public highway. Just before reaching the bridge between the highway and the mill pond is the Sheffield Company's ice house. Every night, in winter, from 12 to 20 teams congregate about the ice house for hauling away the ice. Manure therefore may be easily washed into the mill pond. On the west bank, which is steep, the New York, Ontario and Western railroad passes within 25 feet of the water's edge. It is evident that surface wash from the highway from the vicinity of the ice house, from the bridge and the railroad, together with the sudden stirring up of mud by the influx of water from Guilford lake to the mill pond, brings about considerable pollution of the water supply.

It was therefore recommended in a report dated March 1, 1920:

1. That the owners of the water supply take immediate steps to furnish a supply of unquestionable sanitary quality.

2. That the intake be placed in the lake itself, as previously recommended, and sterilization apparatus be installed and properly operated for the purification of the lake water.

3. That consideration be given to the installation of a modern filtration plant.
4. That the services of a sanitary engineer be secured to make a study of the problem and advise as to the most economical methods by which the improvements may be carried out.

HAMDEN

A reinspection of the public water supply of the village of Hamden was made by Mr. Earl Devendorf, assistant engineer, on September 26, 1919, previous investigations having been made by this Department in 1908 and 1915.

Hamden is an unincorporated village in the town of Hamden, Delaware county, located on the western branch of the Delaware river. The resident population is about 350, all of which are supplied with the public water supply. The waterworks are owned and operated by Mr. Howard D. Youmans of Delhi, N. Y.

The public water supply is derived from a reservoir located on Launt Hollow brook, about one-half mile north of the village. From this reservoir the water is distributed by gravity to the village.

The watershed of Launt Hollow above the reservoir has a drainage area of about 4 square miles, with a total population of 50 inhabitants. The topography of the country is rather steep and the land is devoted to farming and agricultural purposes.

The previous reports recommended that the existing sources of pollution on the watershed be removed and that the supply be sterilized with liquid chlorine, or a new supply of unquestionable quality be developed.

At the time of the recent inspection the watershed was inspected and a number of sources of contamination noted. Also, samples of water were collected and sent to the Division of Laboratories and Research for analysis, the results of which follow:

Intake Overflow

Color	5	Chlorine	1.4
Turbidity	Tr.	Hardness, total	24.7
Ammonia, free	.002	Alkalinity	24.
Ammonia, alb.	.098	Bacteria per c. c.	67500
Nitrites	.003	B. coli type, 10 c. c.	3+ 0—
Nitrates	.020	B. coli type, 1 c. c.	3+10—
Oxygen consumed	3.0	B. coli type, 1/10 c. c.	3+ 0—

Tap Public Supply

Bacteria per c. c.	88000
B. coli type, 10 c. c.	3+0—
B. coli type, 1 c. c.	3+0—
B. coli type, 1/10 c. c.	0+3—

These results show the water to be a soft water having some color and turbidity. The decomposing and decomposable organic matter content is rather high, and the chlorine content is also above the normal for unpolluted surface waters in this locality. The results of the bacterial examination show excessive total counts and the presence of organisms of the B. coli type in all of the 10 and 1 c. c. inoculations examined, indicating the presence of active and potentially dangerous contamination of animal or human origin.

As a result of this investigation it was concluded that none of the former recommendations of this Department have been carried out, and that as

shown by the survey of the watershed and the results of the analyses the supply is subject to serious contamination and unsafe for domestic uses.

It was therefore recommended that the owner carry out the former recommendations of this Department as summarized above, or secure a new supply of unquestionable quality.

HAMMONDSPORT

A reinspection of the public water supply of the village of Hammondsport, Steuben county, N. Y., was made by Mr. Henry Ryon, assistant engineer in this Department, on January 23, 1920, previous investigations of this supply having been made in 1911 and 1914.

The village of Hammondsport is located in the northeastern part of Steuben county, at the extreme southerly end of Lake Keuka. As near as could be estimated the population is about 1,500. The waterworks are owned by the village and under the control of a water board. At the present time the source of supply is Keuka lake. The water board is, however, considering the development of a new supply to be derived from wells.

The conditions at the time of the present inspection were practically the same as at the time of the 1914 investigation. The water is taken from the west side of Keuka lake at the pumping station located about one-half mile north of the village. The intake or suction line from the pump is a 5-inch steel pipe, said to be about 250 feet long and to extend out into the lake to a point where the water is about 60 feet deep.

The lake, and Keuka inlet and Glenn brook, two streams which discharge into the lake at Hammondsport, all receive the surface wash from a thickly populated area, and a considerable quantity of polluted matter is undoubtedly carried into the lake from this source. There are boathouses and other buildings along the edge of the lake, and in the summer the lake is used for bathing and boating which make it probable that accidental or willful pollution of the water frequently takes place. The village has no sewerage system; many of the houses have privies, and the others are provided with cesspools the contents of which are said to seep into the ground.

At the present time the village is constructing a new pumping plant on the southern edge of the village near the electric power station with the intention of obtaining part or all of its water supply from wells drilled in that locality.

Three wells have been sunk in the low flat at the head of the lake between the railroad tracks and Keuka inlet, and about 200 feet north of the latter. These wells are a few feet apart and extend through 30 feet of hardpan into a 7-foot stratum of water-bearing gravel. When the wells were first drilled it is understood that they overflowed, but at the present time the water apparently stands a little below the surface of the ground. A test well sunk to a depth of about 100 feet indicated no other water bearing strata. No definite figure as to the yield of the wells is available.

To the north of the wells on the opposite side from the inlet the slope of the ground rises gently toward the central part of the village. There are about 12 houses within 500 feet of the wells, and two privies within 200 feet of them. Most of the houses in the section near the wells are provided with cesspools which it is understood are seldom cleaned, the contents leaching away into the ground. With two or three exceptions the houses are at higher elevations than the ground at the wells. There seems, therefore, to be a possibility that the wells may be polluted by matter from the cesspools and privies in the vicinity. The wells are so located that there is necessarily considerable passing to and fro near them.

In order to develop the wells an inverted steel shell 20 feet in diameter has been placed around them and sunk to a depth of about 13 feet below the surface of the ground. A 12-inch concrete floor has been laid at the bottom of this shell forming a pump well of about 28,000 gallons capacity. The top of the shell extends about three feet above the surface of the ground.

The casings of the wells have been cut off a little above the bottom of the pump well. At the time of the inspection the shell had not been caulked and leaked badly when the well was pumped out, admitting a large quantity of surface water. A pump has been installed in the pump house adjacent to the well for pumping the water into the village mains. This pump is now connected, and it is understood that well water was pumped into the mains for a few hours. The engineer stated, however, that at all other times the water has been discharged through a by-pass into the inlet whenever the pump well has been emptied.

As a result of the inspection it was concluded that the water supply of Hammondsport is still open to serious contamination from surface wash from inhabited areas, excreta and other matters deposited on the shore of the lake, and accidental or willful contamination from boats or steamers plying upon the lake; and that the location of the new wells is not entirely satisfactory because of their closeness to several houses higher than they using cesspool and privies, and the fact that considerable traffic passes near them.

It was therefore recommended, in a report dated February 5, 1920, that so far as possible the village authorities take steps to prevent polluted matter from reaching the lake or the streams leading to it, and that they immediately install suitable apparatus and sterilize by the use of chlorine or hypochlorite of lime all water pumped into the village mains.

HANCOCK

A reinspection of the public water supply of the village of Hancock was made by Mr. W. J. Erickson, engineering assistant, on May 21, 1920, a previous inspection of the supply having been made in 1913.

Hancock, which is an incorporated village of about 1,500, is located in the southern part of Delaware county, at the junction of the east and west branches of the Delaware river. Of the total population, about 1,000 use the public supply, which is owned and operated by the Hancock Water Company.

The regular supply is derived from Bear creek, a small mountain stream impounded by two storage reservoirs northwest of the village. It is distributed from the lower storage reservoir by gravity through a distribution system consisting of castiron pipe varying from 4 to 8 inches in diameter. An auxiliary supply is derived from Sand creek, northwest of the village. This supply is pumped into the distribution system after passing through a slow sand filter. There is no public sewer system — private sewers, cesspools, and privies being in general use.

Bear brook, from which the regular supply is derived, has a watershed area of about two square miles. One hundred acres adjacent to the reservoir and creek are owned by the company.

The valley of Sand creek above the filter plant is about seven miles in length and comparatively narrow between fairly high wooded hills. The population may be estimated at about 250. Farming, with some wood cutting and quarrying on the hillsides, are the principal occupations on the watershed. There are about 50 houses with accompanying outhouses on the watershed. Most of these are provided with outside privies. Practically all the farms are located so that the run off from them drains eventually into the creek. Though conditions have improved somewhat there are many insanitary places on the watershed especially privies which are so located that rains may carry drainage from them into the stream. The filter is very poorly constructed, and it is doubtful if it is efficient in the removal of bacteria. This cannot be demonstrated except by a series of bacterial analyses.

As a result of this reinspection it was concluded that Bear brook should yield a supply of satisfactory sanitary quality if adequately protected from contamination; that Sand creek cannot be considered to be a satisfactory

source of supply unless satisfactorily treated either by efficient filtration or sterilization; and that the present filter is of unsatisfactory design.

It was therefore recommended, in a report dated October 7, 1920:

1. That the Hancock Water Company apply to this Department for rules and regulations for the protection of the sanitary quality of the water supply.

2. That pending the enactment of rules the water company take steps to prevent the pollution of the water supply by drainage containing human wastes, and that privies near the watercourse be removed to a safe distance.

3. That the water company employ an expert on water supply engineering to advise them relative to the efficiency of the present filter and if found inefficient to advise them as to its reconstruction or the construction of a satisfactory purification plant so that a safe water supply may be obtained.

HAVERSTRAW

A reinspection of the public water supply of the villages of Haverstraw, West Haverstraw, and Stony Point was made by Mr. Earl Devendorf, assistant engineer in this Department, on September 1, 1920, previous investigations of the supply having been made by this Department in 1909 and 1915.

The public water supply is owned and operated by the Haverstraw Water Company. The supply is derived by gravity from a reservoir supplied by a small stream and artesian wells near Thiells; and by pumping from a 4-million gallon reservoir on Cedar Pond brook, about 2 miles northwest of West Haverstraw. The total population served amounts to some 8,100, divided as follows: Haverstraw, 5,700 inhabitants, of which all are served; West Haverstraw, 2,000 inhabitants, of which about 75 per cent are served; Stony Point, 1,000, of which nearly all are served by this public supply.

The Thiells supply is derived from five flowing wells, a small stream, and numerous springs. The water is collected and stored in three reservoirs, two of 500,000 gallons and one of 3½ million gallons storage capacity. There are some 4 or 5 houses on the watershed, all of which are located well back from the supply with the exception of the caretaker's house, which has a cesspool located some 250 feet west of one of the reservoirs.

The Cedar Pond brook supply is subject to serious pollution from many houses located along the bank of the creek within 2 miles above the point of intake. Above this the entire watershed belongs to the Interstate Park Commission, and is practically uninhabited except during the summer season, when campers and vacationists come to the park and the large pond known as Lake Tiorati at the head of the brook. Fishing and boating are allowed on the lake but bathing in the lake is prohibited. The Park Commission intends the further development of this portion of the park by the erection of more camps, and have purchased the rights of the water company in the waters of this brook and pond. They have, furthermore, entered into an agreement with the Haverstraw Water Company whereby the Park Commission will pay the cost, in excess of $15,000, of the erection of a filter plant for the treatment of the waters of this brook, in return for which the lake would be opened for bathing.

Rules and regulations for the sanitary protection of this supply were enacted by this Department on July 14, 1910, and later amended on April 2, 1915. These rules, while allowing boating and fishing upon the lake and stream to a point within 2 miles above the pumping station, when carried on under strict sanitary supervision, prohibit bathing in the lake until a modern filter plant is installed. The very fact that there are thousands of boys and girls camping and roaming over the park property increases the probability of incidental pollution of the water derived from Cedar Pond brook. It is therefore imperative that the proposed filter plant, consisting

of a coagulation basin, slow sand filters, clear well and pump, the plans for which have been prepared by Mr. W. A. Welch, chief engineer of the Park Commission, be installed and put in effective operation at an early date in order to eliminate the possibility of an outbreak of any waterborne disease.

As a result of the inspection it was recommended, in a report dated October 7, 1920:

1. That the water company continue their efforts to reduce sources of contamination upon the watershed of the Cedar Pond brook supply, and make frequent and careful inspections of the watershed of the Thiells supply in order to prevent any contamination of this source of supply.
2. That as previously recommended the water company install a filter plant for the treatment of the Cedar Pond brook supply at as early a date as possible.
3. That pending the installation of the filter plant, the water company immediately purchase and install a chlorination apparatus for the sterilization of the Cedar Pond brook supply and effectively operate the same.

HEMPSTEAD

A reinspection of the public water supply of the village of Hempstead was made by Mr. Alfred Mullikin, assistant engineer in this Department, on June 10, 1920, previous investigations of this supply having been made by this Division in 1915 and 1918.

Hempstead is located in the north-central part of the town of Hempstead, Nassau county, about 22 miles from New York city. The present population is estimated at 7,500, of which 75 per cent are served with water from the public water supply. The waterworks are owned and operated by the municipality under the direction of the board of trustees. The water supply is derived from 8 shallow wells located about ¼ of a mile northeast of the Long Island Railroad station, in a sparsely populated section of land.

From the wells the water is delivered by pumping through a distribution system consisting of some 30 miles of castiron pipe ranging from 2 to 10 inches in diameter. A steel standpipe located on the north side of the pumping station is 20 feet in diameter and 110 feet high, and has a capacity of 258,000 gallons. The daily water consumption is approximately 600,000 gallons in winter and about 1,250,000 gallons in summer. In general, the details of the waterworks system remain as described in the previous report.

As a result of the reinspection of the public water supply of the village of Hempstead, it was concluded that while the water supply was of a satisfactory sanitary quality at the time of the inspection, there are certain opportunities for serious contamination of the water; that there is a possibility of direct contamination of the water by the entrance of surface wash over the low curbs of the wells and indirect contamination by percolation through the soil of polluting matter from the sewer in the street, the privy 400 feet east of the station, or from the surface of the ground around the wells; and that the authorities in charge of the water supply have not as yet carried out the recommendations of the previous report regarding the elimination of the possibility of such pollution.

It was therefore recommended that the concrete well curbs be raised not less than 3 feet above the level of the present surface of the ground, and that suitable embankments be formed around them to prevent surface water from reaching the concrete work; that the area between and around the wells be maintained in neat condition as a lawn and not used for storage purposes or truck gardening, and that no manure, street sweepings, or other fertilizer be applied to this area; and that the privy at the residence 400 feet east of the station be provided with a water-tight container and kept in a satisfactory sanitary condition at all times, or that the house be connected to the sewerage system and the privy abandoned.

HICKSVILLE

A reinspection of the public water supply of the unincorporated village of Hicksville was made by Mr. Alfred Mullikin, assistant engineer in this Department, on May 28, 1920, previous inspections of this supply having been made by this Division in 1915 and 1918.

Hicksville is located in the western part of the town of Oyster Bay, Nassau county, about 27 miles from New York city. The present population is estimated at 5,000, of which about 50 per cent are served with water from the public water supply. The waterworks are owned and operated by the Nassau County Water Company, of which W. J. Drummond is president.

The water is derived from two driven wells located in the southern part of the village. From the wells the water is delivered by pumping into six steel tanks under air pressure and is then distributed by the pressure of the air to the consumers through a distributing system consisting of some 5 or 6 miles of castiron pipe ranging from 2 to 8 inches in diameter. Six steel water tanks rest upon the ground surface and are 8 feet in diameter and 40 feet long, having a capacity of 15,000 gallons each or a total of 90,000 gallons. Only about 60,000 gallons of this space is available for water storage, one-third of the capacity being allowed for storage of air. There are six similar steel tanks used for the storage of air under a pressure of from 100 to 150 pounds per square inch. Of the 700 service taps, practically all are metered. The daily water consumption amounts to 189,000 gallons, or 76 gallons per capita. In general the details of the waterworks system remained as described in the previous report.

As a result of the reinspection of the public water supply of the village of Hicksville, it was concluded that although the supply was apparently subject to considerable pollution at the time the inspection was made, the polluting matter is largely oxidized, as indicated by the fact that the analyses did not show active contamination of the water supply, and it may be therefore considered to have been one of relatively satisfactory sanitary quality at the time of the inspection; that certain potential sources of pollution exist which may at any time cause active contamination of the supply; and that the authorities in charge of the water supply have not carried out the previous recommendations as set forth in our reports.

It was therefore recommended:

1. That the authorities in charge of the water supply cooperate with the village authorities and carry out at once such of our previous recommendations as have not as yet been acted upon, namely:

   (a) That a suitable sewerage system for properly disposing of the sewage of the village be constructed, and all houses in close proximity of the plant be required to connect to this sewerage system.

   (b) That pending the construction of said sewerage system all privies and cesspools within a distance of 500 feet of the wells be properly taken care of as outlined in the above report.

2. That should analyses of the water at any time indicate the presence of active contamination, apparatus for the effective sterilization of the water with liquid chlorine be immediately installed and the water treated with a proper amount of liquid chlorine, directions for applying which may be obtained from this Department.

HIGHLAND FALLS

An inspection of the recently installed chlorination plant for the treatment of the public water supply furnished by the Citizens' Water Company to the village of Highland Falls was made by Assistant Engineer Earl Devendorf on November 7, 1919. A complete report upon an investigation of this supply was made in 1914 and in 1919.

The water supply of Highland Falls is derived from Buttermilk Falls stream, the intake being located about one mile west of the village center.

The water is distributed to the village by gravity and is now subjected to sterilization with liquid chlorine. The installation of this chlorination plant has been made in accordance with the recommendations of this Department. The plant was installed and first put in operation on September 20, 1919. It consists of a manual control dry feed type apparatus manufactured by the Wallace and Tiernan Company. The chlorine is fed directly into the discharge main from the intake reservoir under a 12-foot head. The rate of flow is estimated at 100,000 gallons per day, although there are no meters to confirm this estimate.

When the plant was first put in operation chlorine was applied at the rate of 1 pound per day for a period of about three weeks. This rate was later increased to 1.5 pounds per day, and this was the rate being used at the time of the inspection. Assuming a flow of 100,000 gallons daily, this rate of application would be equivalent to 1.8 p.p.m. of chlorine. As a sample of water collected from the tap from a house about 1,000 feet below the intake reservoir gave no indication of excess chlorine when tested with starch iodide, it is probable that the rate of flow is considerably greater than that estimated.

Following the inspection, samples of water were collected by the superintendent of the water company at times when different amounts of chlorine were being applied to the water. The results of the analyses of these samples are unfortunately somewhat unsatisfactory, due to the liquefaction of the gelatin plates upon which the examinations for total bacterial counts were made. The examinations for organisms of the B. coli type, however, indicate that the chlorination process was reasonably effective in removing active contamination when an amount equivalent to 2 pounds of chlorine per day was being used.

In view of the above fact, it is evident that the water company has carried out the recommendation of this Department with respect to the installation and operation of the chlorination plant for the sterilization of the supply. It should be pointed out, however, that such apparatus, while safeguarding and improving the sanitary quality of the supply, will effect no appreciable improvement in its physical quality, and for this reason the installation of a modern filtration plant is essential if a supply of satisfactory physical quality is to be obtained. It should also be pointed out that the chlorination plant should be, at all times, carefully and efficiently operated, and to this end it would be advisable for the water company to make regular daily determinations for the presence of excess chlorine in the treated water. The chlorine should be so applied that a faint excess of chlorine should be present in samples taken from the tap nearest the reservoir.

It was therefore recommended, in a report dated February 11, 1920, that the water company carry out such of our other recommendations as have not as yet been acted upon at the earliest possible time, and that they maintain the operation of the chlorination plant in an efficient and satisfactory manner.

HILBURN

A reinspection of the public water supply of Hilburn was made by Mr. W. J. Erickson, engineering assistant in this Department, on June 18, 1920, previous investigations having been made in 1912 and 1915.

Hilburn, which is an incorporated village of 1,000, is located in the western part of Rockland county, about half a mile from the New York-New Jersey state line. The water supply is owned and operated by the Mountain Spring Water Company. About 80 per cent of the population is served by this supply.

The supply is derived from two sources, namely: from a storage reservoir located in the hills three-quarters of a mile west of the village; and from a dug well located on the property of the Ramapo Iron Works.

The upland supply is derived by impounding a small stream tributary to the Ramapo river. The watershed area tributary to the supply is about

three-quarters of a square mile. The slopes, which are of granite origin, are precipitous and entirely wooded. There are no permanent sources of pollution on the watershed. Formerly the water from a small stream was piped to the reservoir, but on account of the possibilities of pollution this has been discontinued.

The well supply is derived from a dug well about 45 feet deep and 48 inches in diameter. The casing extends to about 8 feet of the ground surface, above which a concrete curb, mortised to the iron casing, extends to about 2 feet above the ground and has a stone cover to prevent foreign matter from entering the well. The well passes through top soil of sand, then hardpan to water-bearing gravel. It is located between the Ramapo river and the railroad, being about 300 feet from the river and about 100 feet from the railroad. The nearest building is the power plant of the Rockland County Electric Company, in which there are two toilets, located about 100 feet from the well. These toilets are connected by a sewer to a point in the river several hundred feet away from the well and about 10 feet lower than it.

As a result of the inspection it was concluded that though the brook supply is not subject to any permanent sources of pollution, it is subject to accidental or willful pollution from visitors and animals on the watershed; that the brook supply has depreciated as to aesthetic quality by the occurrence of algae and other organic growths in the reservoir; and that the well is unsatisfactorily located and subject to contamination and possibly dangerous pollution.

It was therefore recommended, in a report dated September 27, 1920:

1. That an additional safe and suitable upland supply be secured by the development of other mountain streams near the village to make the use of the well unnecessary.
2. That regular patrols of the watershed tributary to the brook supply be made in order to detect and remove any source of contamination of the supply.
3. That the well supply be abandoned.

HILLVIEW

An inspection of the public water supply of Hillview was made by Engineering Assistant W. J. Erickson on June 4, 1920.

Hillview, a small residential settlement with a population of some 60 people, is located in the town of North Greenbush, Rensselaer county, about one mile south of the city of Rensselaer. The public water supply is owned by the Clinton Heights Spring Water Company, which developed the supply in connection with the improvement of the property. It is leased and operated by the Hillview Improvement Association.

The water is derived from several springs about two miles east of the settlement from which it flows through an open ditch to the intake about one mile below. In addition to the water from the springs, the ditch also receives some water from the overflow from a small pond. From the intake the water was formerly pumped by a windmill into an elevated tank, from which it was delivered by gravity to the consumers. This windmill and tank were burned several years ago and, in their place, the present pump house was built. This house is a substantial brick structure 15 feet square built into the hillside. In it are housed the pump and a pressure tank. The pump is driven by a 3-hp. automatically operated electric motor, and discharges the water into a 2,000-gallon pressure tank. The motor is started when the pressure in the tank gets as low as 30 pounds per square inch and is stopped when the pressure reaches 35 pounds per square inch. In 1916 a new intake was constructed about 300 feet upstream so as to avoid pollution from dwellings located below this point. From this intake the water is conducted to the original intake by an iron pipe.

At the time of the inspection samples of the water were collected and the results of the analyses of these samples made by the Division of Laboratories and Research are as follows:

Color	5	Chlorine	2.2
Turbidity	trace	Hardness, total	215.
Ammonia, free	.004	Alkalinity	188.
Ammonia, alb.	.072	Bacteria per c.c.	1800
Nitrites	.001	B. coli type (10 c. c.)	3+0—
Nitrates	.080	B. coli type (1 c.c.)	0+3—
Oxygen consumed	1.9	B. coli (1/10 c.c.)	0+3—

These analyses show a water that is hard, slightly colored, and practically clear. The figures for nitrogen in its various forms are moderate as are also the figures for oxygen consumed and chlorine, denoting that organic matter is present in small amounts only. The total bacterial count is moderately high and organisms of the B. coli type were found in all of the 10 c.c. inoculations, denoting the presence of active contamination. This, from observations made in the field, is apparently of animal rather than human origin.

From the results of the analyses and from observations made in the field it may be concluded that the supply, though not subject to any permanent source of human pollution, is subject to contamination from nearby pasture and cultivated land, the road crossing the stream, and like all surface supplies is subject to accidental, incidental, and willful contamination by trespassers on the watershed.

It was therefore recommended that the authorities in charge maintain a strict supervision of the water supply at all times in order to detect and immediately remove any source of pollution which may arise.

HINSDALE

An inspection of the public water supply of the village of Hinsdale was made by Sanitary Inspector W. J. Erickson on September 29, 1920.

Hinsdale, which is an unincorporated village of 300 inhabitants, is located in the southeastern part of Cattaraugus county, about 6 miles north of Olean. Of the total population about 100 use the supply, which is owned by the Erie Railroad Company. There appears to be no one directly responsible for the maintenance and operation of the system. The consumers themselves clean the intake reservoir and basin whenever necessary. Most of the consumers have private wells from which their drinking water is obtained.

The supply is derived from a small spring-fed stream east of the village. This stream flows through the village and empties into Olean creek, the source of supply of Olean. The intake dam is located above the Erie railroad just east, and at an elevation of about 80 feet higher than the village. From this intake water is supplied to the consumers by gravity through about a mile of mains varying from 4 to ½-inch in diameter.

The supply is developed by the construction of a small masonry dam about 20 feet long, 4 feet high, and 20 inches thick. This dam forms a small reservoir which has been practically filled by gravel carried down by spring freshets. At the south side of the dam a small intake basin has been constructed against the side of the steep bank. The side toward the bank is of masonry construction and is of semicircular shape. The sides toward the stream are rectangular in shape. The basin is about 6 feet across and 4½ feet deep. There was about 2 feet of water in the basin at the time of the inspection. A wooden cover prevented foreign matter from entering the basin. A 20-inch opening in the lower side of the face parallel to the stream permits the water to enter. Leaves and other foreign matter are kept out by a quarter-inch mesh screen. This screen was very much rusted and was not effectual. The intake pipe extended into the basin and is provided with a strainer with ½-inch holes.

As is noted above, no one is directly responsible for the maintenance and operation of the water supply system. This is rather undesirable, as with no one in charge of the system it is liable to deteriorate and become a menace to the health of the community. For this reason, and on account of the rather unsatisfactory condition of the present supply, it would seem desirable that the village form a water district and develop a new and satisfactory source. In this way the village would obtain absolute control of the water supply and thus could operate it efficiently.

As a result of the inspection it was concluded that the water supply is subject to contamination from pasture lands along the stream, and at times of heavy runoff from possibly dangerous pollution from the farm houses and outbuilding located on the edge of the steep banks of the stream; that the supply is depreciated as to aesthetic quality due to the high turbidity at times of heavy surface runoff; and that the screen at the intake basin was in bad repair and should be replaced.

It was therefore recommended:

1. That the privy at the Rathburn farm be re-located at a safe distance from the bank of the stream and provided with a water-tight vault, the contents of which should be removed and buried at a distance of not less than 200 feet from the stream when necessary.
2. That the chicken yard at the Rathburn place be kept in a sanitary condition.
3. That the barnyard at the Flanagan farm be put in a sanitary condition, and manure pile removed at least 30 feet from gully.
4. That the stream around and for a distance of at least 300 feet above the intake be fenced so as to prevent trespassing on this area.
5. That the intake be provided with a new screen to prevent the entrance of leaves and debris.
6. That the village consider the proposition of forming a water ristrict and developing a new supply of satisfactory sanitary quality.

HOLLAND

A reinspection of the public water supply of the village of Holland, Erie county, was made by Mr. Henry Ryon, assistant engineer in this Department. on January 20, 1920, a previous investigation having been made by this Division in 1916.

The unincorporated village of Holland is located in the town of that name, in the southwestern part of Erie county, about 27 miles south of Buffalo. The estimated population of the village is 650. The water supply is furnished by the Holland Water Works Company. The company uses as a source of supply several springs on a hill about a mile south of the village and a well in the central part of the village and has recently drilled two wells at the south edge of the village with the intention of using the water from them to supplement the present supply. There is no record of the amount of water furnished but it is roughly estimated at 20,000 gallons per day. A storage reservoir of approximately 350,000 gallons capacity receives the surplus water from the springs. The water is not treated before it enters the distribution mains.

The conditions at the time of the recent investigation were practically the same as at the time of the previous one. The water from the springs was being used and supplemented by water from the well. The supply was apparently inadequate, for at the time of the inspection the pump was operating at the rate of about 25,000 gallons per day and it was impossible to raise the pressure at the pumping station above 20 pounds per square inch, a pressure too low to supply the higher parts of the village.

In order to obtain more water the company has drilled two additional 6-inch wells about 10 feet apart on the southern edge of the village. The wells are about 60 feet deep and extend through 30 feet of earth and 30

feet into shale rock. The well casings extend about 2 feet above the ground. It was stated that these wells were tested for quantity and yielded about 75 gallons a minute. The water level remains approximately 20 feet below the surface of the ground. The wells are located on the north edge of a low flat piece of land that is wet during part of the year, and it will apparently be necessary to protect the wells from the entrance of surface water by grouting around the casings and banking or by other suitable means. There are no buildings on the flat but on the land to the north or the village side of the wells which rises abruptly from the flat there are 4 or 5 houses within 500 feet of the wells. These houses are said to be sewered into the creek.

It was therefore recommended, in a report dated February 3, 1920 —

1. That as previously recommended the springs below the barn be abandoned as a source of water supply for the village, and that the privy located on the north side of the hill be removed to the south slope.
2. That all houses within 1,000 feet of any well (especially those above the level of the well) be provided with sewers, and that all sewer pipe within 200 feet of any well be of castiron laid with lead joints.
3. That before the water from the new well is turned into the mains the casing be grouted and embankments constructed effectively to prevent any surface water from approaching within ten feet of the wells.
4. That the water company consider the replacing of the wooden mains by castiron pipe.

HOLLEY

A reinspection of the public water supply of Holley was made by Mr. Earl Devendorf, assistant engineer in this Department, on September 28, 1920, a previous investigation of the supply having been made by this Department in 1917.

Holley is an incorporated village of some 1,700 inhabitants located in the eastern part of Orleans county, about 30 miles west of Rochester. The village is provided with a system of sanitary sewers and a sewage disposal plant consisting of Imhoff tanks and sprinkling filters, the effluent of which is discharged into Sandy creek. The water supply was formerly owned and operated by the Brockport–Holley Water Company but was acquired by the village in 1917, and is now operated under the direction of the board of trustees. The supply is derived from several springs or shallow wells located about 1½ miles south and southwest of the village, from which the water is pumped into the distribution system by two pumping plants. The consumption varies from 65,000 to 200,000 gallons per day, of which the manufacturing consumption amounts to 35,000 to 75,000 gallons per day.

At pumping station No. 1 there is a receiving well constructed with a steel casing and provided with a wooden cover. It is 15 feet in depth and 25 feet in diameter, and has a capacity of 50,000 gallons. There are four wells connected with the receiving well at the station, known as the Downs well, the North Salisbury well, the South Salisbury well, and the Clarendon well.

The Downs well is located about one-eighth of a mile south of the main pumping station in the middle of a field used as pasture. Although the village does not own the land surrounding the well, it does own the water rights and has a right of way for the pipe line. At the time of the inspection a horse and cow were found pastured in the vicinity of the well. The well is octagonal in form, 15 feet in depth and approximately 20 feet in diameter. It is constructed with a stone wall laid up with cement. The walls extend above the surface of the ground some 4 or 5 feet. The well is provided with a wooden cover. The bottom of the well is Medina sandstone which is said to contain large fissures. A door, which is kept locked, is provided for entering the well. The depth of water in the well was approximately 9 feet. No nearby permanent sources of pollution were observed at the time

of the inspection. The nearest building was a barn located about 300 feet away from and below the well. The engineer at the pumping station stated that this well normally furnished from 25,000 to 30,000 gallons per 24 hours. No foot-valve is provided on the main leading to the receiving well at the pumping station and the water normally flows by gravity. At times of low flow, however, the engineer can pump from the wells to the receiving well and thereby augment the normal flow, as was being done at the time of the inspection.

The North and South Salisbury wells are located about one-eighth of a mile southwest of the main pumping station, and the village owns a strip of land some 600 or 700 feet in length and 200 feet in width surrounding these two wells which are located approximately 500 feet apart. The North Salisbury well is approximately 20 feet in diameter and 15 feet in depth, laid up with a stone masonry wall extending from the Medina sandstone rock to about 5 feet above the surface of the ground, and is provided with a wooden cover. In the bottom of the well a 6-inch hole, 70 feet in depth, has been drilled, and the 4-inch suction pipe extends into this hole 40 feet below the bottom of the well. A door, which is kept locked, is provided for entering the well. At the time of the inspection the depth of the water in the well was approximately 7 feet.

The South Salisbury well is 15 feet in depth and 20 feet in diameter, is laid up with a masonry wall extending 5 feet above the ground level, and is provided with a wooden cover. The door provided for entering the well is kept locked. The well extends to Medina sandstone rock into which a 6-inch drilled hole has been sunk. The 4-inch suction line extends only to the top of this drilled hole. The depth of water in the well was approximately 8 feet at the time of the inspection. No foot-valves are provided for the suction pipe at either the North or the South Salisbury well, and the water normally flows by gravity to the receiving well at pumping station No. 1. In times of low flow, however, the water may be drawn by means of the pumps at the pumping station into the receiving well, thereby augmenting the normal flow. No nearby sources of pollution were found at the North or South Salisbury wells. The land surrounding the wells, however, is used for pasture.

The Clarendon well, located about two miles southwest of the village near the highway, is approximately 16 feet in depth, and is constructed in the form of an angle, the two legs of which are approximately 60 feet and 114 feet in length, respectively, and 20 feet in width. The water at the time of the inspection was approximately 7 or 8 feet in depth. The well is provided with a wooden curb which has in several places rotted away, and there are now large holes giving opportunity for surface wash, animals, and foreign matter to enter. This well was not used last year, but due to the excessive demand and the shortage of water the well has been put in use during this past summer. In this connection it should be stated that the present excessive consumption should be reduced by the installation of meters and the discovery and elimination of any large leaks. While no nearby permanent sources of pollution were found at the time of the inspection, no fence is provided to prevent animals or trespassers from entering the land surrounding the well, which together with the poor condition of the curbing affords opportunity for contamination of either an accidental or willful nature.

The pipe line leading from the Salisbury and Clarendon wells to the receiving basin at pumping station No. 1 is laid in the bed of a small stream on which a dam has been constructed just above the pumping station, and the water impounded was formerly used for operating the pumps used to pump water for the village. At the time of the inspection the creek had been drawn down and a small leak had been discovered in the pipe line leading from the wells. At the time of the inspection the pipe line was under pressure in spite of the fact that the pumps were being used for drawing water from the wells. The leak, however, should be repaired and care taken to discover and repair any of the leaks that may occur in the future, since it is possible that hydrostatic conditions might occur which

would create a negative head in the pipe line and thereby allow the contaminated creek water to enter.

Pumping station No. 2, which pumps water from the Glidden wells, has been reconstructed this year and consists of a one-story masonry building. There are two wells, the north and south Glidden wells, from which water is pumped from this station into the distribution system, the excess over consumption going to the standpipe. Normally the pumps are operated eight hours per day, but for the three days previous to the time of the inspection the pumps had been operated 24 hours per day. The north Glidden well is 24 feet in depth, constructed in gravel, and is built of wooden cribbing in the shape of an octagon approximately 25 feet in diameter. There was approximately 5 feet of water in the well at the time of the inspection. A 6-inch suction pipe from the well is connected to the pump and is provided with a foot-valve. About 300 feet south of the north Glidden well and attached to the pumping station building is the south Glidden well. This well has been provided during the past summer with a new concrete curb and sides extending down for about 15 feet, below which there is approximately 4 feet of timber cribbing. The well is approximately 25 feet in diameter, and is provided with a cover. The water was approximately 4 feet in depth at the time of the inspection. Normally, there is said to be 10 to 12 feet of water in these Glidden wells. The south well is at a higher elevation than the north well. The pump is operated with the valve on the south well suction open three turns and the valve on the north well suction wide open. This is said to maintain the water level in the two wells approximately at the same elevation. There were no sources of pollution near the Glidden wells. A small stream bed passing near the Glidden wells was dry, and the engineer was informed that previous to the wells being operated the stream flowed almost continuously, indicating that the ground water had been sufficiently lowered around these wells to cause the stream to disappear except during periods of heavy runoff.

It was therefore recommended, in a report dated November 26, 1920:

1. That the authorities in charge of the public water supply take immediate steps to cut down the daily consumption by the installation of meters and the stoppage of any large leaks in order that the present public supply may be sufficient for the public needs.
2. That fences and proper drainage ditches be constructed around the Salisbury and Downs wells in order to eliminate the opportunities for contamination, and that if after these precautions are taken contamination still exists, these sources of supply be sterilized by means of liquid chlorine, or a new source of supply be obtained.
3. That the authorities in charge of the public water supply have the leak in the main now located in the bed of the creek immediately stopped.
4. That the Clarendon well be either abandoned or properly protected from pollution by the construction of a new water-tight curbing, drainage ditches, and fencing.

HORSEHEADS

A reinspection of the public water supply of the village of Horseheads, Chemung county, was made by Mr. Earl Devendorf, assistant engineer in this Department, on April 28, 1920, a previous investigation of this supply having been made in 1916.

Horseheads is an incorporated village located in the western part of Chemung county, about six miles north of Elmira. Newton creek, which discharges into the Chemung river, flows through the village. The population at the time of the inspection was estimated to be about 2,000.

The water supply is owned by the village and operated by the village board of trustees. The water supply is obtained from springs located approximately one-half mile east of the village on the east side of Beaver brook.

The water is pumped from a collecting well by means of a motor operated Rumsey triplex pump into the village distribution system, the surplus going to a reservoir located on a hillside about 1½ miles east of the village. There are about 12 miles of water mains varying from 4 to 10 inches in diameter, and the average pressure in the village is approximately 95 pounds per square inch. There are 479 service taps, all of which are metered. The average daily consumption is estimated to be approximately 125,000 gallons per day. The capacity of the reservoir is approximately 275,000 gallons.

At the time of the recent inspection it was found that the conditions had been changed to some extent. An earthen embankment had been constructed along the easterly bank of Beaver brook in an endeavor to keep the water from the brook from flowing into or through the springs located above the collecting well. This embankment, however, was only from 1 to 2 feet above the surface of the brook at the time of the inspection, and the engineer was informed that during the spring freshet the brook overflowed this embankment, became mixed with the spring flow and thence flowed into the collecting well, causing the public water supply at that time to be quite turbid. The village authorities have also purchased and fenced in the land surrounding the springs located north of the pumping station. A house with barn and outbuildings is located on the property north of the springs. The barn is some 200 feet distant from and above the land surrounding the springs, and at the time of the inspection was not in use. The house was occupied at the time of the inspection, and the privy is located approximately 50 feet beyond the barn. A cultivated field lies east of the springs, and a corner of it is so located that the surface wash from it flows on to the land surrounding the springs. The village authorities are at the present time negotiating with the owner for the purchase of this property.

At the factory of the Nestle's Food Company it was found that there was a cross connection between the village water supply main and that of an auxiliary supply taken from an old canal and pumped to an elevated tank. This cross connection consisted of a plain 2-inch gate valve. It was stated that the city supply is seldom used, but it is considered necessary to augment the auxiliary supply at times of breakdown. This cross connection should be provided with double check valves in addition to double gate valves in accordance with the plans adopted and approved by this Department for such connections. In other respects the conditions surrounding the supply are the same as these described in our former report. The village authorities have not carried out our previous recommendation of securing a new source of supply, but have however secured the services of Mr. Charles C. Hopkins, consulting engineer of Rochester, to draw plans for enlargement of the present reservoir. The cost of this improvement is estimated at approximately $13,000, and at a special election held the day previous to the date of the inspection the village rejected the proposition of carrying out the improvement at this time.

In view of the above it was therefore recommended:

1. That as previously recommended a new source of supply be obtained which will be both adequate in quantity and of satisfactory sanitary quality, either by the construction of new wells to be located in more satisfactory surroundings or by obtaining water from the public supply of the city of Elmira.

2. That until such a new and satisfactory supply can be obtained, the present springs and collecting well be properly protected against contamination by the construction of adequate embankments to prevent the brook at times of high water from overflowing the land near the springs and collecting well, and the surface wash from the land near the springs from contaminating the public source of supply, and by the purchase of the triangular field located east of the springs.

3. That at the Nestle's Food Company factory the auxiliary supply used for manufacturing and boiler purposes be separated from the public water supply by the use of double check valves, in accordance with the plans approved by this Department, a plan of which is appended hereto.

HUDSON

A reinspection of the public water supply of the city of Hudson was made by Engineering Assistant W. J. Erickson on May 25, 1920, a previous investigation of the supply having been made in 1913.

Hudson, a city with a population of about 12,000, is located in the western part of Columbia county, on the east bank of the Hudson river. Practically all of the population of the city and about 200 people in outlying districts are served by this supply. The waterworks are owned by the city and are under the direction of the commission of public works.

The water supply is derived from Taghkanic creek, at a point about 12 miles southeast of the city, and from a small stream tributary to the Churchtown reservoir. From the intake dam of the creek water flows through a 16-inch and a 12-inch pipe to the Churchtown reservoir (85,000,000 gallons), thence by gravity to the filter plant located on a hill three-quarters of a mile southeast of the city. After passing through a slow sand filter the water is distributed to the consumers through 18 miles of castiron mains. In addition, there are about 16 miles of castiron pipe from the reservoirs to the city. The average consumption is about 2,000,000 gallons per day.

The original slow sand filter at Hudson was the second to be installed in the United States. This has been discontinued and is now being used as a clear water basin. The present sand filter is uncovered and has an area of .53 acre. The depth of sand is kept at about 6 feet under which is about a foot of graded gravel. The depth of water maintained over the filter is generally 3 or 4 feet. The average rate of filtration is about 3,780,000 gallons per acre per day and the maximum rate is 4,710,000 gallons per acre per day. There are no regulating devices for automatically controlling the rate of filtration. Filtered water is collected by a series of open joint bell and pigot drain tile. When it is necessary to clean the filters water from the clear water basin is first used after which unfiltered water is delivered to the consumers.

The main drain filter tile discharges the filtered water into a rectangular masonry effluent chamber which is divided by a concrete wall into two compartments. The filtered water has been chlorinated in the second compartment since 1914. At the time of the inspection about .3 parts per million of liquid chlorine were being applied to the water. From the effluent chamber the water is discharged into two covered clear water or distributing reservoirs having a total capacity of 3,448,000 gallons. These basins are below and adjacent to the filter bed.

As a result of the inspection it was concluded that the supply was of reasonably satisfactory sanitary quality, and that with continued efficient operation of the filter and chlorination apparatus the plant should yield a satisfactory water; that certain recommendations made by Mr. Hazen in regard to the operation of the filter plant have not been carried out; and that the lack of duplicate filter units makes it necessary periodically to interrupt the filtration while the bed is being cleaned and to deliver unfiltered water to the consumers.

It was therefore recommended:

1. That the Commission of Public Works carry out the recommendations of Mr. Hazen's report regarding the installation of regulating apparatus at the filter plant.
2. That the filter bed be subdivided in order to facilitate cleaning, or that another filter unit or units be added.
3. That all the water be effectively chlorinated before delivery to the consumers.
4. That the city continue making its frequent and regular inspections of all parts of the watershed in order to detect any violations of the water rules and to abate any such violation should it occur.

HUNTINGTON

A reinspection of the public water supply of the unincorporated village of Huntington, Suffolk county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on June 21, 1920, a previous inspection of this supply having been made by this Division in 1915.

Huntington is located in the northwestern part of the town of Huntington, about 36 miles from New York city. The population in winter is estimated at 8.000, and increases in summer to 12,000. Of the total population, about 75 per cent are served with water from the public water supply. The waterworks are owned and operated by the Huntington Water Works Company.

The water supply is derived from 12 driven wells located in the southeastern part of the village. The water is pumped into tanks under air pressure for serving the lower part of the village, and into a concrete reservoir for serving the upper part of the village, from which the water flows by gravity to the distribution system, consisting of 27 miles of cast-iron pipe. The average daily water consumption in winter is approximately 175,000 gallons, and in summer increases to 225,000 gallons. Since the last inspection the only change which has been made in the plant is the abandonment of one 250,000-gallon Worthington pump.

The wells are 8 inches in diameter and 60 feet deep, driven through 20 feet of sand, 2 feet of hardpan, and 38 feet of water-bearing gravel.

The district in which the plant is located is only sparsely populated, there being six or eight houses within 500 feet of the plant. About 150 feet east of the plant several houses are provided with concrete cesspools which are cleaned periodically and inspected monthly. A 10-inch tile sewer, part of the village sewerage system, passes within 40 or 50 feet of the wells. A privy is located southwest of the pumping station that is provided with a metal container.

As a result of the reinspection of the public water supply of Huntington, it was concluded that the water supply of the village of Huntington cannot be considered as one of entirely satisfactory sanitary quality; that the supply is apparently receiving pollution from some source and that no provision has been made to sterilize the water; and that the houses in the vicinity of the water plant and wells have not all been connected to the sewerage system.

It is therefore recommended that the water company immediately install suitable apparatus for the sterilization of the water with liquid chlorine, and apply the chlorine to the water continuously and in proper proportions effectively sterilize it at all times; and that steps be immediately taken to determine and as far as possible eliminate the sources of pollution.

IROQUOIS (Thomas Indian School)

Plans for a pumphouse and pumping equipment for the waterworks of the Thomas Indian School, at Iroquois, Erie county, N. Y., consisting of state architect's drawing No. 2015, were submitted to this Department for approval on June 10, 1920. The plans were carefully examined by the Engineering Division, and in a report dated July 2, 1920, it was recommended that they be approved subject to the condition that before the pumping equipment be installed detailed plans of pump piping and connections and the method of protecting the well against surface wash should be submitted to this Department for approval. The plans were approved in accordance with these recommendations on June 10, 1920.

On July 24, 1920, plans for additions to the equipment of the water supply at the school, consisting of state architect's drawing No. 2016, were submitted to this Department for approval, and after careful consideration by the Engineering Division were approved on July 27, 1920.

JAMAICA WATER SUPPLY COMPANY

A reinspection of the public water supply furnished by the Jamaica Water Supply Company to the village of Floral Park, the unincorporated villages of New Hyde Park and Bellrose, and portions of the towns of Hempstead and North Hempstead in Nassau county, and also to Jamaica, Richmond Hill, Hollis, Springfield, Laurelton, and other places in Queens county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer, on May 12 and 14, 1920. A previous inspection of this supply was made by the Engineering Division in 1916.

The waterworks are owned and operated by the Jamaica Water Supply Company. The total population served by the water supply is estimated at between 65,000 and 70,000.

The water supply is derived from three groups of driven wells, two of which are located in Jamaica and one in Elmont. From the wells the water is pumped through a distribution system consisting of 190 miles of castiron pipe ranging from 4 to 16 inches in diameter. Three steel standpipes take the surplus and act as equalizing reservoirs, maintaining a pressure in the municipalities of approximately 80 pounds per square inch.

There are two pumping stations at Jamaica, known as No. 1 and No. 2, which deliver approximately 1,250,000 gallons and 4,500,000 gallons daily, respectively. The Elmont pumping station delivers approximately 1,600,000 gallons daily. The total daily consumption, therefore, is approximately 7,350,000 gallons, or about 113 gallons per capita. In general, the details of the waterworks system remain as described in previous reports, with the exception that four shallow wells have been driven at one plant, and that a new pumping plant, located in Jamaica, will be put in operation within a month.

In a report dated December 6, 1920, the following conclusions were drawn:

1. That the authorities in charge of the water supply have carried out the previous recommendations of this Department.

2. That there are certain possibilities of serious contamination of the supply at the No. 1 pumping station, namely, the open well chambers which contain considerable rubbish and are subject to pollution; the possibility that dangerous contamination may reach the supply from the pumping station toilet which is located very close to the receiving well; and the unsatisfactory conditions of the blow-off pit located near the stream.

3. That the iron content of the water from No. 2 pumping station is high and may cause the water to be unsatisfactory in taste, color, odor, and by the formation of deposits.

It was therefore recommended:

1. That the authorities in charge of the water supply clean, repair, and properly cover the well chambers at No. 1 plant, provide a more sanitary toilet and toilet-room and maintain them in satisfactory condition, and connect the toilet to a line of castiron pipe having tight lead joints to conduct the sewage to a suitable cesspool located at a considerable distance from the supply or to a sewer.

2. That the blow-off or abandoned well pit be filled in with dirt and the blow-off pipe extended to the stream.

JEFFERSONVILLE

A reinspection of the sanitary condition of the public water supply of Jeffersonville was made by Mr. W. J. Erickson, engineering assistant, on June 15, 1920, a previous inspection of this supply having been made in 1915.

Jeffersonville, which is an unincorporated village of about 400 inhabitants, is located in the northwestern part of Sullivan county, about halfway between Callicoon and Liberty. The village has been formed into a water district under the direction of the board of water commissioners.

The water supply is derived from a storage reservoir on Lickel brook, about a mile and three-quarters north of the village. From this reservoir the water is conducted by gravity through an 8-inch pipe to the distribution system, consisting of three miles of mains varying from 4 to 8 inches in diameter. At times of fire the supply is supplemented by pumping direct from Callicoon creek. The water supply system is practically the same as described in the previous report.

At the time of the present inspection the Lickel reservoir was full and the water in it was very highly colored. The bottom of the reservoir was covered with brush and growths. The area tributary to the reservoir is approximately 4 square miles in extent and has a population of about 60 inhabitants, or 15 per square mile. There are about 12 dwellings on the watershed, most of which are located back from the stream and its tributaries. There are, however, some opportunities for contamination by the wash from cultivated fields and grazing lands along the stream as well as from the highways traversing them. Rains had fallen steadily for some time previous to the inspection.

Callicoon creek flows through relatively thickly populated land and consequently there are numerous possibilities for the contamination of this supply. It was stated that when the supply has to be used, adequate warning is given to the consumers to boil their drinking water. However, it has been found by experience that all the consumers will not boil their drinking water, even though adequate warning so to do has been given. It would therefore seem advisable that the auxiliary supply be sterilized, and in order fully to protect the consumers the regular supply should also be sterilized.

From these considerations the following conclusions were drawn in a report dated September 22, 1920:

1. That the water supply of Jeffersonville as derived from Lickel brook is subject to indirect contamination by surface wash from pasture lands and from highways traversing the watershed.

2. That the water is depreciated in aesthetic quality by the high color and turbidity caused by the brush, grass, and algae on the reservoir, and from the wash from the road passing near and above the reservoir.

3. That the Callicoon creek supply is subject to more serious contamination from dwellings and other permanent sources of pollution on the watershed as well as from chance visitors thereon.

It was therefore recommended:

1. That the board of water commissioners of Jeffersonville make regular and thorough inspection of the watershed of Lickel brook and Callicoon creek in order to detect any sources of contamination, and when such sources of contamination are found they be immediately removed.

2. That the Lickel brook be protected from surface wash by the construction of adequate drainage ditches to divert the road drainage to a point below the reservoir.

3. That the Lickel brook reservoir be cleaned of all grass and underbrush in order to obtain a supply as free as possible from decaying organic matter and algae.

4. That the commissioners apply to this Department for the enactment of rules and regulations for the protection of the public supply.

5. That should it be found necessary to use the supply from Callicoon creek, ample warning be given to the residents of the village to boil the water used for drinking purposes.

6. That on account of the many opportunities for contamination, particularly on the watershed of the Callicoon creek, and due to the fact that experience teaches that all drinking water will not be boiled even if warning so to do has been given, the board of water commissioners consider the advisability of installing some form of steriliziation apparatus to treat the supply, either by the application of liquid chlorine or by chloride of lime.

JOHNSON CITY

A reinspection of the public water supply of Johnson City was made by Mr. Earl Devendorf, assistant engineer, on September 25, 1919, a previous investigation having been made by this Division in 1916.

Johnson City is an incorporated village of about 9,000 inhabitants located in the southern part of Broome county, 3 miles west of Binghamton. The public water supply is owned and operated by the village under a board of water commissioners.

The water supply is obtained from 6 drilled wells 8 inches in diameter, and 2 dug wells 5 feet and 6 feet in diameter respectively, all of which extend to a depth of 60 feet. These wells are located in the northern part of the village near Chocomut creek. In addition, there are 2 dug wells 5 feet in diameter and 20 feet and 25 feet in depth, located at the Endicott-Johnson mill in the village. From the wells the water is pumped direct to the distribution system, the excess over the consumption going to a reservoir located on a hill about 1 mile north of the village. The average volume of water pumped from the municipal station amounts to approximately 1,300,000 gallons per day. In addition, approximately 1,750 gallons per minute were being pumped from the Endicott-Johnson mill, wells giving a total distribution of 2,500,000 gallons per 24 hours. A large percentage of this amount is used for industrial purposes.

At the time of the recent inspection it was found that none of the former recommendations of this Department had been carried out, and that at the time the village was experiencing an extreme shortage in its available water supply. Additional new wells were therefore being drilled on Camden street, near the Susquehanna river in the western part of the city. The engineer was informed by the city officials that a temporary connection was to be made with the public water mains from this source of supply.

For the immediate consideration of the officials, therefore, a preliminary report on the sanitary quality of these new wells was made and transmitted to the village officials under date of October 6, 1919, in which it was pointed out that the wells could be considered as a satisfactory addition to the present water supply if the quantity should prove sufficient; and furthermore, that if the land in the vicinity of the wells should remain vacant and no sources of pollution established at nearby points, it was probable that the quality would continue to be satisfactory.

Additional wells have been added to the public water supply since the time of the 1916 investigation. Two dug wells 20 feet and 25 feet in depth and 5 feet in diameter are located at the Endicott-Johnson mill, and are known as the old well and new well respectively. Each well is provided with a steel casing extending from the surface to the bottom of the wells. The new well has been in use since December, 1918, and while the normal rate of operation is 2,500 gallons per minute, only 1,500 gallons per minute were being pumped at the time of the inspection. Water from the old well is pumped by means of a 6-inch Fairbank-Morse centrifugal pump, operated normally at a rate of 1,000 gallons per minute, but at the time of the inspection the rate of pumping was only 250 gallons per minute. The city of Binghamton trunk sewer passes within 50 feet of the old well and 25 feet of the new well.

At the main pumping station a well 5 feet in diameter and 60 feet in depth was dug in 1916, and in 1917 another well 6 feet in diameter and 60 feet in depth was dug. These dug wells and the 6 drilled wells are connected to the suction lines direct. The 6-foot well has not been used at any time owing to a leak in the suction line from it. The sanitary surroundings of these wells are as described in the previous report and are not satisfactory.

In view of the above facts, the following conclusions were drawn in a report dated March 4, 1920:

1. That none of the previous recommendations of this Department have been carried out by the authorities in charge of the water supply of Johnson City.

2. That the village was experiencing an extreme shortage in its available water supply at the time of the investigation.

3. That the additional well supplies at the Endicott-Johnson mill which have been added to the public water supply are derived from ground water sources subject to pollution.

4. That as pointed out in our previous report the present public water supply is derived in part from ground water receiving pollution from various sources.

5. That the new well supply which has been developed in the western part of the village appeared to be of a satisfactory sanitary quality at the time of the inspection.

It was therefore recommended:

1. That the village authorities in charge of the water supply take steps to carry out the recommendations of the former report at as early a date as possible.

2. That in view of the many questions of prime importance in connection with both the sanitary quality and the quantity of the supply, it is further recommended that the village engage the services of a competent consulting expert to advise them in regard to the development of a new permanent source of supply of satisfactory sanitary and physical quality.

KEESEVILLE

A reinspection of the sanitary condition of the public water supply of Keeseville was made by Mr. W. J. Erickson, engineering assistant, on September 10, 1919, a previous inspection having been made in 1915.

Keeseville is an incorporated village of about 1,800 inhabitants, and is situated partly in Clinton and partly in Essex counties, about 5 miles inland from Lake Champlain. The village derives considerable water power from the Ausable river which flows through the village. There are no public sewers but numerous private sewers empty into the river, and there are also numerous cesspools and privies.

The public water supply, which is owned by the village and operated by the board of water commissioners, is derived in part from the Ausable river and in part from a deep well driven near the bank of the river. The intake is located just above the power dam of the village on the south bank of the river. The water is pumped directly into the distribution system. There is a reservoir on the top of the hill in the southern part of the village, but it was not in use as the pumping pressure is not sufficient. There are approximately 6 miles of mains varying from 10 to 2 inches in diameter, on which there are 180 service taps, 85 per cent of which are metered. The pressure is about 75 pounds at the pumping station, but some difficulty is experienced in obtaining sufficient pressure in the upper part of the village. There are about 1,000 consumers, or about 55 per cent of the population of the village.

A flume carries the river water to the water-wheels which operate the pumps and to the suction well. This flume takes the water from near the surface of the river near the south shore. Between the flume and the suction well is a galvanized iron screen with 1/4-inch mesh.

The well is 503 feet in depth. The first few feet is through the top soil, the rest of the distance being through rock of varying character. An 8-inch casing extends to a depth of 200 feet. The largest amount of water is said to be derived from between the depths of 200 and 300 feet; the yield, however, is rather small. At the time of the inspection the well was not being used.

The present inspection found the conditions the same as on the former inspection and that none of the recommendations had been carried out. The Ausable river is unsatisfactory as a source of water supply on account of the pollution which enters it. The watershed has an area of approximately 476 square miles, consisting mainly of steep slopes in the Adirondack mountains.

Except for several villages and hamlets the watershed is sparsely populated. There are in all about 9,000 residents on the watershed, or 19 per square mile. The principal centers of population are Clintonville, Ausable Forks, Black Brook, Jay, Upper Jay, Keene, Keene Valley, Wilmington, and Lake Placid. At some of these villages sewers are known to empty into the river, and the same is probably true at the majority of the hamlets. Lake Placid has a sewer and sewage disposal system the effluent of which eventually reaches the river. At Ausable Forks the pulp mills discharge sulphite wastes into the stream. In Keeseville itself there are sewers which discharge into the stream above the intake. Besides the numerous permanent sources, there are also many other opportunities for accidental or willful contamination by inhabitants and visitors on the watershed.

The well is very unsatisfactorily located in a thickly settled neighborhood. In addition to the general possibility of serious contamination, there is a leaky storm sewer also carrying the sewage of 3 or 4 houses, which passes within a few feet of the well. It seems possible that at times the well water receives contamination either from this sewer or from the numerous privies and cesspools above the well, by seepage through the fissures in the rock.

The unsatisfactory condition of the water supply is very well known to the inhabitants and it is stated that few if any use the supply for drinking purposes without boiling, potable water being obtained generally from private wells.

As a result of the inspection it was concluded that the recommendations of our previous report have not been carried out by the village authorities although the need for them still exists and that the water supply of Keeseville is derived from sources that are unsatisfactory from both the physical and sanitary standpoints.

It was therefore recommended in a report dated January 15, 1920, that the village authorities take immediate steps to carry out the previous recommendations of this Department.

KINGS PARK (State Hospital)

Plans for proposed extensions to the water supply system, consisting of state architect's drawing No. 2073, to serve the new building for acute patients at the Kings Park State Hospital, Kings Park, Suffolk county, N. Y., were submitted to this Department for approval by the State Architect on March 17, 1920. After careful consideration by the Engineering Division the plans were approved on March 19, 1920.

LAKE PLACID

A reinspection of the sanitary condition of the public water supply of Lake Placid, was made by Mr. W. J. Erickson, engineering assistant, on September 5, 1919, previous inspections of this supply having been made in 1911 and 1914.

Lake Placid is an incorporated village in Essex county, located on the shores of Mirror Lake, a small lake emptying into the West branch of the Ausable river and adjacent to the southern end of Lake Placid. The village is located in a region of great natural beauty and is a well known summer resort. It has a permanent population of about 1,800, while in the summer vacationists increase it to about 6,000.

The water supply derived from Lake Placid is owned by the village, and the present plant was put in operation in 1906. A chlorination plant for the treatment of the supply was installed in 1918. There are about 17 miles of mains, ranging from 1 to 12 inches in diameter, under an average pressure of 95 pounds per square inch. Besides serving all of the village itself, it serves the camps of the Whiteface Inn district, Buck Island,

and the Ruisseaumont district. The population served ranges from 1,800 in winter to 6,000 in summer.

Lake Placid has a water surface of 3.2 square miles and a total drainage of 20.7 square miles. There are about 75 summer cottages or camps on its shores. The Shore Owner's Association is cooperating with the local board of health in taking steps to prevent the pollution of the supply. Those camps which are not connected with the public sewer system are required to have watertight collecting cesspools from which the sewage is pumped to disposal plants some distance from lake or streams tributary to the lake. Practically all are finely appointed permanent camps and in satisfactory sanitary condition. Inspections are made regularly once a month to detect and abate any pollution which may arise. As the lake is used considerably for bathing, boating, and fishing, there are possibilities of pollution from these sources.

The chlorination plant was not in operation at the time of the inspection, and the superintendent informed the inspector that it had not been operating for some time, due to the objections of the consumers because of the taste. It was stated, however, that the plant would be put in operation shortly. When in operation chlorine is applied at the rate of about .18 p. p. m.

From the above facts the following conclusions were drawn: That the water supply of Lake Placid is comparatively free from possibility of contamination during the winter but is subject to contamination during the summer months, from the residents and visitors along the lake and its tributaries; that though the efforts of the village authorities tend to reduce the number of permanent sources of contamination, sanitary patrol alone cannot be relied upon to prevent all temporary sources or acts of contamination; that on account of the use of the lake for pleasure purposes there exists the possibility of direct contamination of the lake water at the intake which might bring about disastrous consequences were the chlorination apparatus not operating.

It was therefore recommended in a report dated January 12, 1920, that the authorities continue their vigorous policy in abating and controlling sources of contamination, and that the chlorine plant be operated carefully and continuously, especially during the summer months.

LIVINGSTON MANOR

A reinspection of the sanitary condition of the public water supply of Livingston Manor was made by Mr. W. J. Erickson, sanitary inspector in this Department, on October 28, 1920. a previous investigation of this supply having been made by this Division in 1919.

Livingston Manor is an unincorporated village with about 1,500 inhabitants, located in the northern part of Sullivan county, Practically all of the inhabitants use the public supply which is owned and operated by the Old Homestead Water Company.

The supply is derived from Hardenburg creek, a small stream which is fed by Matawa and Leneppe lakes. An intake dam has been constructed on this stream about 2 miles south of the village, forming a small distributing reservoir. From this reservoir the supply flows by gravity through a distribution system consisting of about 2 miles of 10-inch wooden mains, and about 6 miles of castiron pipe varying from 3 to 8 inches in diameter, on which there are 153 service taps only one of which is metered. The average pressure in the village is about 65 pounds per square inch. In general, the system is as described in the previous report.

As a result of the inspection it was concluded that the sanitary quality of the water supply of Livingston Manor is menaced during the summer months by the use of the lakes at the headwaters of the stream tributary to the reservoir for recreational purposes, and pollution from animals and

chance visitors on the watershed; that the supply is depreciated as to physical quality by the high turbidity caused by rapid runoff at times of heavy rainfall, and by tastes and odors from algae growths during the warm summer months; and that the shallowness of the reservoir, with dead trees and other vegetation in it, render conditions favorable for the development of algae growths.

It was therefore recommended in a report dated December 8, 1920:

> That as a means of affording better protection of the water supply from contamination by residents or chance visitors on the watershed, the Old Homestead Water Company publish and enforce rules and regulations for the protection of the supply enacted by this Department in 1914; that as a means of further safeguarding the sanitary quality of the supply, the company install suitable apparatus for the sterilization of the supply by chlorination, and apply proper amounts of chlorine to the water at all times; that in order to improve the physical quality of the supply the depth of the reservoir be increased by increasing the height of the dam as planned, and by stripping the bed of the reservoir of dead timber, brush, and other decaying vegetable matter; that the growth of algae be prevented by the judicious use of copper sulphate; that the company consider the installation of a modern filtration plant.

The water of this supply is used by the New York, Ontario and Western Railway Company for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on December 14, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were not entirely satisfactory, and that the results of the inspection and the analyses of the samples, together with the results of previous inspections and analyses, indicate that the water cannot be considered to be of satisfactory sanitary quality for human consumption unless the recommendations made in our report are carried out. A copy of the report accompanied this data.

LOCKPORT

A reinspection of the public water supply of the city of Lockport was made by Mr. Earl Devendorf, assistant engineer in this Department, on March 19, 1920, previous investigations of the public water supply having been made by this Division in 1911, 1915, 1916, 1917, 1918, and 1919.

Lockport is a city of some 20,000 inhabitants located about 20 miles east of Niagara Falls, 25 miles northeast of Buffalo, and 12 miles south of Lake Ontario. The water supply of Lockport is obtained by pumping from the Niagara river, the intake being located about one-fourth of a mile below the intake of the city of North Tonawanda, and about one-fourth of a mile from shore. The water is conveyed from the intake by means of a pipe line to a large suction well, from which it is drawn and pumped after chlorination into the pipe line leading to the city some 14 miles away. The daily water consumption, as obtained from the records of the Venturi meter at the pumping station, varies from 6,000,000 to 7,500,000 gallons per day. This corresponds to a daily per capita consumption of from 325 gallons to 350 gallons.

Previous investigations have shown the unsatisfactory sanitary quality of the Niagara river water, and the reports upon the inspections subsequent to the installation of the chlorination plant have recommended careful and continuous operation of the chlorination apparatus and the application of adequate amounts of chlorine, the use of scales to check the accuracy of the control, regular bacteriological analyses, the installation of a duplicate chlorinator, the construction as soon as feasible of a modern filtration plant and storage facilities.

As a result of a recent inspection it was learned that since the last inspection a new Wallace & Tiernan chlorination apparatus of the dry-feed type has

been installed. It was also learned that all of the recommendations named above have been carried out with the exception of the latter two, namely the installation of a modern filtration plant and storage facilities.

At the time of the recent inspection the engineer was informed by the operator at the pumping station that the river water had been very turbid on March 11, 12, and 13 of this year. From the health officer it was learned that the results of an analyses of a sample of water collected on the 13th of March showed the presence of gas in all of the presumptive tests, indicating a dangerously polluted condition of the supply. The public was accordingly informed on the evening of March 15 by means of handbills and announcements from the moving picture theatres, that the water was unsafe for use without boiling. In addition to these notices, an advertisement was inserted in the daily paper on March 16 advising the people to boil the water, and at the time of the inspection this advertisement was still running in the daily paper.

Following this investigation, a second investigation was made by this Division during the week of March 29 to determine the cause of the very turbid condition of the Niagara river during the period of March 11, 12 and 13. As a result of this second investigation, covering an examination of the weather bureau records of wind and weather conditions prior to and subsequent to this period, testimony of other waterworks officials operating plants along the Niagara river, and an examination of the records of operation of these plants, it was determined that this turbid condition of Niagara river was the result of excessive high water conditions of Buffalo creek which carried surface wash to the Niagara river. This condition was very unusual and lasted for a period of only two or three days.

At the time of the recent inspection a copy of the report on the bacteriological analysis of samples of water collected during this period was obtained from the superintendent of water of the city of Lockport. A table showing the results of these analyses is given below:

Date	Total Count 48 hr. Gelatine	B. coli 1 c.c.	B. coli 3 c.c.	B. coli 10 c.c.
March 10	26	0+3—	0+3—	0+3—
	27	0+3—	0+3—	0+3—
13	340	3+0—	3+0—	3+0—
	460	3+0—	3+0—	3+0—
14	330	0+3—	1+2—	3+0—
	345	0+3—	0+3—	2+1—
15	135	0+3—	0+3—	2+1—
	115	0+3—	0+3—	1+2—
	205	0+3—	2+1—	2+1—
	170	0+3—	0+3—	2+1—
	155	0+3—	0+3—	1+2—
16	117	0+3—	0+3—	2+1—
	128	0+3—	0+3—	1+2—
17	92	0+3—	0+3—	0+3—
	92	0+3—	0+3—	0+3—

The results of these analyses show that the public water supply of Lockport was seriously polluted for a period of some three or four days due to the very turbid condition of the Niagara river caused by the heavy runoff referred to above. In this report it should be pointed out that had a storage reservoir of a capacity equivalent to three or four days' consumption been available, the pumping of this very turbid water might have been stopped until the disappearance of the turbidity in the river. Another important circumstance which shows the urgent need for a storage reservoir is the fact that the city is supplied with water pumped through a single pipe line some 14 miles in length. Should any accident occur in this pipe line the city would be without fire protection as well as without water for domestic purposes in a very short time, since the standpipe has a capacity equivalent to approximately only

one-half a day's consumption. If a storage reservoir having sufficient capacity for several days' consumption were provided, the city would be supplied with water for a sufficient period to permit of repairing any ordinary break in the pipe line.

As a result of the recent investigation it was concluded that all of the previous recommendations of this Department have been carried out with the exception of the construction of a modern filtration plant and the installation of a storage reservoir; that the recent unsatisfactory sanitary quality of the water supply was occasicned by the very turbid condition of the Niagara river which lasted for a period of 3 or 4 days about the middle of March; that the preventive measures undertaken immediately by the local health authorities in the form of advising the people to boil the water and the administration of typhoid vaccine probably prevented any serious outbreak of waterborne disease. It was therefore recommended in a report dated April 14, 1920, that a modern filtration plant be installed as soon as practicable, and a storage reservoir of sufficient capacity for several days' consumption to be constructed near the city at an early date in order that a sufficient supply of water of a satisfactory sanitary quality may at all times be furnished to the consumers of Lockport; that the city continue the present method of careful operation of the chlorination plant and the making of frequent analyses of the supply in order to check the efficiency of the sterilization of the supply.

LONG BEACH

A reinspection of the public water supply of Long Beach was made by Mr. Alfred Mullikin, assistant engineer, on January 7, 1920, a previous inspection having been made in 1915.

Long Beach is an incorporated village in the town of Hempstead, Nassau county, having a summer population of about 5,000. It is situated on an island parallel to the south shore of Long Island, about 25 miles from New York city. The waterworks are owned and operated by the Long Beach Water Company.

The water supply is obtained from a dug well 9 feet in diameter and 50 feet deep, known as well No. 1, located in East Rockaway, in the town of Hempstead, about 1,000 feet south of Lynbrook station of the Long Island railroad. The water company owns another well, known as well No. 2. located on the north side of the East Rockaway passenger station at Long Lane, a few feet from the Long Island railroad tracks. This well has been abandoned although when used it will yield 400 gallons per minute. At this well there is a 6-inch cross-connection with the Queens County Water Company which can be used for an emergency supply.

The water from the well is pumped to the Long Beach standpipe through 20.000 feet of 24-inch force main, which is of wood stave construction except at channel crossing where castiron pipe is used. At ebb tide the force main is exposed in numerous places. Due to repeated exposure to tidal conditions in a salt marsh, the steel bands have corroded, and the wood has disintegrated to such an extent that for several years only by continual repairs has the force main been kept in service. At times of low pressure it is possible that the head of marsh water over the pipe line is greater than that within the pipe and that leakage of polluted salt water may enter the main.

The results of these analyses show a water of good physical characteristics as regards color, appearance, and taste. The figures for nitrogen in its various forms, with the exception of those for nitrates, are not excessive. The rather high figures for nitrates indicate organic pollution of the ground water tributary to the supply, which however had undergone natural processes of purification. The increase in the chlorine content after the water had passed through the long pipe to Long Beach indicates the infiltration of salt marsh water. The total bacterial counts are usually moderate and from no samples have organisms of the B. coli type been isolated from any inoculations.

As a result of the investigation it was concluded that the public water supply of Long Beach was of a satisfactory aesthetic and sanitary quality at the time of the inspection; that the condition of the long force main from the Lynbrook pumping station to Long Beach is such that infiltration of salt marsh water may occur under certain conditions; that there is some possibility of contamination reaching well No. 1 through the 6-inch pipe extending from the strainer section to the surface; that pollution of the ground water tributary to the well may be brought about from the privy at the pumping station in case the privy is not maintained in a sanitary condition at all times; and that the abandoned well at the East Rockaway railroad station is open to possible contamination due to its inadequate protection from trespassers and to the manner in which water is drawn therefrom by residents in the vicinity.

It was therefore recommended, in a report dated January 28, 1920, that the waterworks authorities take action toward the replacing of the present woodstave force main; that a cap be placed over the 6-inch pipe at well No. 1, and a float and cord telltale be used to determine the well water level; that the privy and the vicinity at the pumping station be maintained in proper sanitary condition; that the well at East Rockaway be kept securely locked, and that regular analyses be made of the supply, and if contamination be found present steps be taken to eliminate its source if possible, or to sterilize the supply with liquid chlorine.

LONG EDDY

A reinspection of the public water supply of the unincorporated village of Long Eddy was made by Engineering Assistant W. J. Erickson on May 20, 1920, a previous inspection of this supply having been made by this Division in 1915.

Long Eddy, a village with a present population estimated at 250, is located in the western part of Sullivan county. Of the total population, about 100 are served by the public supply. The waterworks are owned and operated by the Long Eddy Water Company under the supervision of Mr. Armstrong, superintendent.

The supply is derived from Pea brook, a small stream tributary to the Delaware river. The intake is located about three-quarters of a mile north of the center of the village. The water is supplied by gravity through about a mile of water mains varying from 2 to 6 inches in diameter. There are about 30 taps in the village, none of which are metered. The average pressure in the village is 80 pounds per square inch. There is no accurate data as to the consumption.

A small timber dam has been constructed across the stream, and numerous 1-inch holes are drilled in a wooden bulkhead to admit the water into a small wooden box from which an 8-inch pipe leads to a small storage reservoir approximately 30 feet wide, 100 feet long, and about 4 to 5 feet deep, formed by a masonry dam located a few hundred feet below the intake. A wooden flume carries the water from the upper end of the reservoir to a point near the intake to the village main. This reservoir was practically empty at the time of the inspection, the water going directly into the mains. It had not been cleaned for some time and the bottom was covered with a fine mud and branches at the time of the inspection. Considerable trouble has been experienced from algae growths.

The watershed tributary to the intake is approximately 4 square miles. The valley is narrow, bounded by high, rocky hills. The upper part of the valley is less precipitous and wide. The runoff is very rapid due to the rocky and shaly formation of the valley. There are several abandoned quarries along the valley which were at one time extensively worked. There is at present considerable farming done in the valley.

The total population may be estimated at 80, or about 20 per square mile. There are about 15 houses, a church, a schoolhouse, a butter factory, and a

sawmill on the road paralleling the stream. In addition to possible indirect contamination from these places, there are opportunities for contamination from highway wash and runoff from cultivated fields and pasture lands.

As a result of the inspection it was recommended: that the water company clean the reservoir in order to prevent as far as possible the growth of algae, and if necessary treat the water with copper sulphate applied in proper quantities; that the intake be protected by suitable screens or strainers; that the water company make a thorough inspection of the watershed from which the supply is derived, and eliminate all direct source of pollution found thereon; that should the water company experience any difficulty in removing all direct sources of pollution, it should apply to this Department for the enactment of rules and regulations for the sanitary protection of the supply.

MANHASSET

A reinspection of the public water supply furnished by the Manhasset and Lakeville Water District of the unincorporated villages of Manhasset, Great Neck Hills, a part of Great Neck, and Plandome, Nassau county, was made by Mr. Alfred Mullikin, assistant engineer, on June 11, 1920, a previous inspection of this supply having been made by this Department in 1915.

Manhasset is located in the northwest part of the town of North Hempstead, about 15 miles from New York city. The present population is estimated at 3,000, of which about 50 per cent or 60 per cent are served with water from the public water supply. The waterworks are owned and operated by the municipality under the direction of the Manhasset and Lakeville Water District, of which Mr. Owen P. Kennedy is chairman.

The water supply is derived from four driven wells located west of the village on the west bank of Manhasset Bay, about three-quarters of a mile southwest of the Manhasset depot. From the wells the water is pumped through the distribution system consisting of 27 miles of castiron pipe ranging from 4 to 12 inches in diameter the surplus going to a steel tank having a capacity of about 160,000 gallons. The pressure in the village ranges from 60 to 145 pounds per square inch. There are 605 service taps, of which 500 are metered. The average daily water consumption ranges from 151,000 gallons in winter to 600,000 gallons in summer. In general the details of the waterworks system remain as described in the previous report.

The four driven wells are located in a low swampy land about 1 acre in area near the Long Island railroad. The wells vary in depth from 133 to 157 feet. One well is 3 inches in diameter, another 4½ inches, and two are 8 inches in diameter. The strata through which the wells pass consist of 100 feet of sand, 5 feet of very fine sand and clay, and the remainder of the distance through a water-bearing gravel.

While there were no direct sources of pollution noticed at the time of the inspection, it is possible that pollution may enter the supply either by percolation through the soil from the existing privies and cesspools located among a number of houses 200 feet south of the well.

From the recent inspection it appears that the municipal authorities have carried out in part the previous recommendations as set forth in our report, in that a sewerage system has been constructed in the vicinity of the plant, that some of the buildings located near the wells have been connected to this sewerage system by castiron pipes, that the cesspool which receives sewage from the toilet at the pumping plant has been abandoned and this toilet connected to the sewerage system, that two privies some 50 feet from the well have been abandoned, and that analyses of the water are made yearly to detect active contamination of the supply.

As a result of this inspection it was concluded that the water supply was of a relatively satisfactory sanitary quality at the time of the inspection; that the authorities in charge of the water supply have in part carried out the previous recommendations of this Department, but that there remain

certain opportunities for contamination of the supply from privies and cesspools near the well. It was therefore recommended that the municipal authorities carry out at once such of our previous recommendations as have not been acted upon and that the authorities maintain a careful sanitary patrol at all times in the vicinity of the wells to detect and eliminate any possible sources of pollution.

MARCY (Utica State Hospital)

Plans for a filter plant and a pumping station for the Marcy division of the Utica State Hospital were submitted to this Department for approval by the State Engineer on April 26, 1920. The plans proposed for the construction of a waterworks consisting of coagulation basins, gravity mechanical filters, a clear water basin, a chlorinating plant, and centrifugal pumping equipment. After careful consideration by the Engineering Division the plans were approved on April 28, 1920.

Plans for a distribution system for the water supply of Marcy division of the Utica State Hospital, consisting of state architect's drawings Nos. 2089 and 2096, were submitted to this Department for approval on July 10, 1920, and after careful consideration by the Engineering Division were approved on August 9, 1920.

MASSENA

A reinspection of the public water supply of the village of Massena was made by Mr. Alfred Mullikin, assistant engineer, on January 27, 1920, a previous investigation of this supply having been made in 1911, 1915, 1916, and 1917.

Massena is a village located in the northern part of St. Lawrence county, about 160 miles north of Utica. It occupies both banks of the Grasse river. The water supply is owned by the St. Lawrence Water Company and is pumped from the Massena power canal. Part of the supply is pumped to the plant of the Aluminum Company of America and part to the village. All the water is treated with liquid chlorine and that delivered to the village is filtered through two pressure mechanical filters. The population is about 10,000. The amount of water pumped to the plant of the Aluminum Company is 2,700,000 gallons daily, and to the village is 2,250,000 gallons daily. There are no domestic water meters and only 12 commercial meters.

At the time of the inspections only one of two suction mains was in use, due to the fact that one of the two chlorine solution chambers was undergoing repairs. The solution chambers are placed about 10 feet above the suction main on a separate platform to overcome back pressure. The chlorine feed for 4.75 million gallons amounts to 13.5 pounds, or .35 parts per million.

The recent inspection disclosed the fact that although the Water company has apparently been operating the chlorination plant with care and efficiency, the capacity of the filtration plant has not been increased to meet the increased rate of water consumption nor have proper coagulation and sedimentation facilities been provided. The rate of filtration when the filters are in operation is approximately 400 million gallons per acre per day, a rate nearly four times the proper rate for this type of filter.

As result of this investigation it was concluded that steps have not been taken by the Water Company to install a sedimentation basin nor to increase the filter area as previously recommended by this Department; that liquid chlorine is being carefully applied to the water but that chemical or bacteriological tests are not made in order to obtain comparable records of the raw and filtered water. It was therefore recommended that sedimentation be provided, and that additional filters be installed as previously recommended by this Department; that if it is planned to apply chlorine to two different suction lines, a second control apparatus be installed, and that a competent consulting engineer be obtained to advise them as to the best method of placing the water purification plant in proper condition.

MECHANICVILLE

An investigation of an outbreak of typhoid fever in the city of Mechanicville was made on April 12 and 13, 1920, by Mr. Earl Devendorf, assistant engineer. On September 28, 1920, a reinspection of the water supply of this city was made by Mr. Henry Ryon, assistant engineer. Previous investigations of the supply were made by this Department in 1917, 1918 and 1919.

Mechanicville is a city of 8,900 inhabitants, located in the southeast part of Saratoga county, on the west bank of the Hudson river. Practically all of the inhabitants of the city are served by the public water supply, which is delivered to the consumers through about 22 miles of mains, varying from 4 inches to 6 inches in diameter, on which there are some 1,100 service taps, all of which are metered. The total water consumption is estimated at about 1,500,000 gallons per day, of which the railroad and the factories in the city use more than half. The pressure in the village varies from 60 to 85 pounds per square inch. Part of the supply is filtered and an attempt is made to chlorinate all of it.

The supply is derived from two streams known as Plum brook and Baker brook, and collected by two impounding reservoirs—one located on plum brook about 1½ miles northwest of Willow Glen, a small hamlet about 2 miles west of Mechanicville; and the other on Plum brook just below its junction with Baker brook, about ¼ of a mile northwest of Willow Glen. The capacity of the upper reservoir is estimated as 90 million gallons and the watershed tributary to it has an area of approximately 2.0 square miles. The lower reservoir has a capacity of about one million gallons and an area tributary to it of approximately 2.2 square miles, exclusive of that of the upper reservoir, making the total watershed 4.2 square miles. The population on the shed is estimated at about 200 persons, or about 50 persons per square mile. In 1919 all the houses on the watershed were visited by representatives of the Engineering Division of this Department, and it was found that in 10 out of 20 houses there were histories of typhoid fever.

The upper reservoir is connected directly to the city distribution system, the elevation being sufficient to furnish a satisfactory pressure without pumping. The lower reservoir is too low to give a satisfactory pressure by gravity and a pumping plant has been constructed immediately below the reservoir, arranged to force the water into the pipe leading from the upper reservoir to the city, which passes a few feet to the east of the station. The water from the lower reservoir is all filtered before being discharged into the main, and when the plant is operating properly is treated with liquid chlorine in sufficient quantity to sterilize it and also the water which flows to the city by gravity from the upper reservoir.

The water passes first through the roughing filter and then through the sand filters from which it is discharged into a clear water basin. No coagulant is used. The character and method of operation of the filters is such that it seems improbable that effective purification is secured.

The pumping equipment consists of 2 Worthington tandem compound duplex pumps, one 10x16x10x12, and the other 14x20x14x12. The latter was in use at the time of the inspection and was operating at 32 r. p. h., which with a reasonable allowance for slip would indicate that it was discharging water into the main at the rate of about 1,300,000 gallons per day. Since the average water consumption of the city is in the neighborhood of 1,500,000 gallons per day, and the maximum rate of consumption probably considerably higher than the average, it is at once evident that at certain times a considerable proportion of unpurified water from the upper reservoir must reach the consumers. A single 75 h.p. boiler is provided for supplying steam for the pumps. It is understood that this boiler is cleaned once a month and the filters by-passed while the boiler is being cleaned.

The chlorinating apparatus is located in the pump room of the station and consists of a Wallace & Tiernan manual control solution-feed type B apparatus. At the time of the inspection the chlorination apparatus was not

being used because the city had no chlorine, and as far as could be learned had had none since about September 13, 1920. It was therefore impossible to observe the rate of application of chlorine or learn anything regarding the effectiveness of the chlorine treatment. Reports on the bacteriological examination of the water by Mr. George E. Willcomb, consulting engineer for the city, indicate that some trouble has been experienced in securing an effective sterilization of the water even when a fairly large amount of chlorine is applied, due to some extent, as pointed out by Mr. Willcomb, to the organic content of the water but also probably to the method of application of the chlorine. It would seem advisable that until the plant has been reconstructed or a new supply developed, some means be provided for taking samples from the main just below its junction with the discharge pipe from the pumping station, so that samples of the water may be readily taken at frequent intervals; and that such samples be taken and tested for excess chlorine and the rate of application of the chlorine regulated accordingly.

At the time of the inspection there were six cases of typhoid fever in the city, and the records of this Department show that outbreaks of this character have occurred at frequent intervals during the past few years. In November and December of 1915, there were six cases of typhoid in the city. In June and July of 1916 there were 51 cases, followed by 6 more in the following few months. In 1917 there were 36 cases, the largest number occurring in August and December. In the early part of 1918, 31 cases occurred in the city.

In March and April, 1920, an outbreak of 15 cases of typhoid occurred. This outbreak was investigated by the Engineering Division of the Department, and as a result of this investigation it was concluded that the outbreak was the result of an infection of the public water supply, due to the fact that the city authorities had failed to carry out the improvements and recommendations of the Engineering Division with regard to the installation of the chlorination plant and the making of certain improvements at the pumping station, which had they been properly carried out would have without doubt prevented the outbreak of typhoid. It was accordingly recommended that the city authorities take immediate steps toward the installation of a chlorinating apparatus; that as soon as installed this apparatus be operated with the greatest possible care; that a new source of supply be obtained or a new filtration plant be constructed, or the present filtration plant reconstructed without delay; that if it was decided to reconstruct the present filter plant, provision be made for coagulating the water, and a coagulation basin be constructed and the pipe of the filters be arranged so that the first filtrate after washing may be wasted; and that the sanitary conditions on the watershed be improved.

Apparently no steps have been taken to improve the conditions on the watershed, and the filter plant has not been improved, nor as far as could be learned have any steps been taken toward the improvement of the plant or the construction of a new one. The recommendation regarding the installation of the chlorine apparatus has however been carried out, but, as pointed out above, the apparatus was not in operation at the time of the inspection of September 28, 1920.

From such information as could be obtained it appears that no chlorine was applied to the water from September 14 to October 2; and that during that period the polluted water from the brooks was allowed to pass into the mains with no other treatment than the partial filtration which the results of the analyses of the samples taken at the time of the inspection show was not effective in removing the contamination. This interruption in the application of chlorine was due to the city authorities allowing the supply of chlorine to become exhausted. In this connection it should be mentioned that the city authorities were on June 28, 1920, notified by the Engineering Division of this Department of the fact that owing to transportation conditions trouble was being experienced by many municipalities in securing shipments of chlorine, and were requested to furnish this Department certain information regarding their chlorine supply so that the Department might assist them if necessary, in case of danger of shortage. No

reply to this letter was received. On June 30 another letter was sent to them by the Engineering Division, advising them how shipments of waterworks chemicals could be expedited through the Interstate Commerce Commission, and they were advised to keep a considerable quantity of chlorine on hand in order to avoid any possibility of a shortage. Apparently these warnings and suggestions were disregarded, for the supply was allowed to become exhausted and no effort made to secure a prompt shipment of the chemical in accordance with the advice of June 30, 1920, even after the supply had become exhausted.

In view of the above facts it was concluded:

1. That the water supply of Mechanicville is not in satisfactory sanitary condition.

2. That frequent outbreaks of typhoid fever have occurred in the city due to the unsatisfactory condition of the water supply.

3. That these outbreaks might have been and future outbreaks may be prevented by carrying out all of the recommendations of this Department, and exercising careful supervision over the watershed and the operation of the treatment plant.

It was therefore recommended:

That unless a new satisfactory course of supply is developed, the treatment plant be reconstructed or a new plant constructed, and

a A coagulant be added to the water in proper proportions at all times;

b A coagulation basin of suitable size, fitted with the necessary appurtenances, be provided and used;

c The piping of the filters be arranged so that the first water after washing may be wasted;

d A duplicate boiler be provided as that it will not be necessary to shut down the plant in order to clean the boiler;

e The piping near the station be rearranged so that raw water of the upper reservoir cannot be allowed to flow into the distribution system of the city;

f Liquid chlorine be applied to the filtered water continuously and in proper proportions.

That pending the completion of such improvements:

a All the water furnished to the city be sterilized at all times by the continuous application of a sufficient amount of liquid chlorine;

b A tap be made on the main a short distance below the junction of the main to the discharge pipe of the pumping station;

c Samples of water be taken from this tap at frequent intervals and tested for excess chlorine in accordance with the method approved by this Department;

d The rate of application of the chlorine be regulated in accordance with the results of these tests;

e A careful record be kept of the weight of chlorine used each day.

That the watershed from which the supply is derived be carefully inspected at frequent intervals and the rules and regulations for the protection of the supply from contamination enacted by this Department strictly enforced.

MEDINA

A reinspection of the public water supply of Medina was made by Mr. Earl Devendorf, assistant engineer in this Department, on October 16, 1920, a previous investigation of this supply having been made in 1916.

Medina is an incorporated village of some 6,500 inhabitants located in the western part of Orleans county. The village is served by a municipal sewer system which discharges without purification into Oak Orchard creek, a small stream flowing through the village and discharging into Lake Ontario.

The water supply is owned by the village and operated under a board of trustees. The supply is obtained from a dug well located about 3 miles south

of the village, from which it is pumped to a concrete reservoir from which it flows by gravity into the village mains and a standpipe located in the village. Approximately 95 per cent of the population is served with the supply, and the consumption is estimated at about 1½ million gallons per day, or 230 gallons per capita per day. There are numerous cold storage and canning factories which, together with The New York Central Railroad Company, use during the season approximately 400,000 gallons, or 60 gallons per capita per day. This gives a domestic consumption of 170 gallons per capita per day, which is a very high rate.

The recent inspection was made as the result of information reaching this office that due to the shortage of water it had been necessary for the village to use canal water. At the time of the inspection it was ascertained that the standpipe located in the village had been painted during the summer and that before the painting had been completed the canneries and cold storage plants started operation, using large quantities of water, and it had been impossible to pump enough water from the supply to fill the standpipe. This reduced the amount of storage usually kept ahead, and occurring just at a time when the large consumers were drawing heavily reduced the storage held in the reservoir until it was necessary to augment the well water supply by the use of the fire pump at the S. A. Cook Furniture Company factory, which was used to pump water consisting of a mixture of canal water and Oak Orchard creek water. Pumping was begun at 11 A. M. on September 28 and continued until 1 A. M., October 1, 1920. The public had been previously warned by handbills distributed from house to house and by advertisements in the public newspapers, in which they were advised to boil the water. The fire pump is said to be connected by a plain gate valve to the village distribution system, which arrangement constitutes a potential source of contamination of the public supply. The pump is an 18 x 10 x 12-inch steam pump manufactured by the George F. Blake Manufacturing Company, and is said to have a rated capacity of 1,000 gallons per minute at 70 r.p.m.

At the time of the inspection it was stated that the village authorities in charge of the public water supply are contemplating augmenting the present water supply by the construction of an additional well or wells. Before any final plans are adopted, however, it seems advisable that the village engage a competent water supply expert to make a thorough investigation of the available sources of public water supply in the vicinity and advise them as to the most economical and proper means of developing the best source of supply in order that a public water supply may be furnished to the residents of the village which shall be at all times adequate in quantity and of a proper sanitary quality.

As a result of the inspection it was concluded in a report dated November 23, 1920, that as previously pointed out the public water supply of Medina is derived from a source which is free from any serious pollution, although it is subject to the possibility of pollution reaching the supply through the limestone formation in which the well is located; that due to excessive demand during the past summer by the canneries and cold storage plants located in the village, the public water supply was depleted and it was necessary to pump untreated water from Oak Orchard creek and the Barge canal overflow; that the fire supply system at the S. A. Cook Furniture Company, derived from Oak Orchard creek and the Barge canal overflow, is connected at present with the village distribution mains by a plain gate valve and may constitute a potential source of danger to the health of the residents of the village.

It was therefore recommended that the village authorities engage the services of a competent water supply expert to aid them in augmenting the present water supply; that in case it becomes necessary to again pump water from Oak Orchard creek and the Barge canal overflow before the supply is augmented by water from satisfactory additional sources, the water be first chlorinated in such a manner as effectively to sterilize the supply before it is pumped into the public mains, employing an engineer, if necessary, to advise them as to the means for carrying out this recommendation; that the present

cross-connection between the fire pump at the furniture factory of the S. A. Cook Company and the village distribution mains be disconnected, or that a double check and gate valve be installed in an accessible manhole, in accordance with the general plans approved by this Department, a blueprint of which is attached to the report.

MERRICK

A reinspection of the public water supply of the unincorporated village of Merrick, Nassau county, Long Island, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on May 20, 1920, a previous inspection of this supply having been made by this Division in 1915.

Merrick is located in the southern part of the town of Hempstead, about 27 miles from New York city. The present population is estimated at about 1,500. Of the total population, approximately 50 per cent are served with water from the public water supply. The waterworks are owned and operated by the Hempstead and Oyster Bay Water Company.

The water supply is derived from four driven wells and one tile well located in the center of the development about one-fourth of a mile south of the Long Island Railroad station. From the wells the water is delivered by pumping through a distributing system consisting of about 6 miles of castiron pipe ranging from 2 to 6 inches in diameter. An elevated wooden tank having a capacity of about 15,000 gallons takes the surplus and acts as an equalizing reservoir, maintaining for domestic use an average pressure in the municipality of approximately 20 pounds per square inch. For fire protection, however, approximately 80 pounds per square inch is available from a pressure tank. This steel pressure tank has a total capacity of about 12,000 gallons. Of the 125 service taps, only relatively few are metered. The average daily water consumption in winter is approximately 20,000 gallons, and in summer approximately 35,000 gallons, or 27 and 47 gallons per capita respectively. In general, the details of the waterworks system remain as described in the previous report, with the exception that a windmill which supplemented the other pumping machinery has been abandoned. This windmill was ordinarily used to pump the water required for domestic use during the winter period.

The wells consist of two 3-inch driven wells, two 4-inch driven wells 45 feet deep, one 12-inch tile well about 35 feet deep, and one new 18-inch tile well 36 feet deep constructed in 1919. Surrounding the top of the 12-inch tile cased well is a manhole of brick about 3 feet in diameter and 5 feet deep. The water level rises in the well within about 6 feet from the surface of the ground. This well is not in use at present. The new 18-inch tile well is surrounded by a brick manhole about 3½ feet square and 5 feet deep which is provided with an unlocked wooden cover. The water level in this well recedes to a depth of 10 feet 4 inches from the surface of the ground while the pumps are in operation.

The land on which the plant is located is leased by the company and only a small tract is provided. Although the territory in the immediate vicinity of the well is now sparsely settled, it is probable that houses may be erected very close to the wells at some time in the future.

From the recent inspection it appears that the nearby buildings are provided with cesspools, which, however, in some cases may not be impervious; that no analyses are made throughout the year; and that there is apparently little opportunity for pollution of the ground water in the immediate vicinity of the wells.

As a result of the reinspection of the public water supply of Merrick it was concluded, in a report dated July 15, 1920, that the authorities in charge of the water supply have in part carried out the previous recommendations of this Department.

It was therefore recommended that precautions should be taken to see that all buildings erected in close proximity of the wells are provided with im-

pervious cesspools, or privies with watertight containers, the contents of which should be regularly removed and properly disposed of in a remote place; that the pump pit be made impervious to prevent the entrance of surface water which is now generally allowed to seep into the ground at the west end in close proximity to the source of water supply; and that an impervious sump hole be constructed and a hand pump be installed in order that any water collecting on the floor may be delivered to some point remote from the wells.

MEXICO

A reinspection of the public water supply of Mexico was made by Mr. Earl Devendorf, assistant engineer, on August 6, 1919, a previous investigation of this supply having been made by this Division in 1916.

Mexico is an incorporated village of 1,300 inhabitants located in Oswego county, on the Niagara Falls, Oswego and Richland branch of the New York Central railroad, about half way between Oswego and Richland; and is also located on the Salmon river and Black creek.

The public water supply is owned by the municipality, and is operated by a board of water commissioners of which Mr. A. W. Richardson is superintendent. The supply is derived from the east branch of Black creek, about 2 miles south of the village. From the creek the supply is pumped after treatment with alum and hypochlorite of lime through pressure filters into the distribution system, and thence to a steel standpipe located in the village having a capacity of 140,000 gallons. The consumption varies from 40,000 to 60,000 gallons per 24 hours, corresponding to a per capita rate of 63 gallons and 92 gallons respectively.

The watershed of Black creek above the point from which the supply is derived is about one square mile in area and is principally used for agricultural purposes. There are some 40 or 50 inhabitants residing on the watershed. Nearly one-half of the area consists of swamp and wood land. The farm houses are located well back from the stream and afford very little opportunity for direct pollution of the water.

The recent inspection disclosed that the conditions of the public water supply remained practically the same as at the time of the former investigation and that the recommendations of our former report had apparently not been carried out. Except for the installation of a new auxiliary gasoline engine and an increase in the number of water consumers, the waterworks system remains as described in the former report.

At the filter plant the solutions are mixed in the chemical tanks, and it is customary to mix 20 pounds of alum and 1 pound of hypo per batch. The batches usually last for about 3 days' pumping, it being planned to mix a new batch after one day's pumping and to allow it to settle until the next day when it is ready for use. On the day of the visit, however, the operator had pumped for about one hour without treatment by alum or hypo due to having run out of the chemical solutions and having just mixed a new batch. In this connection it should be pointed out that no water should be pumped into the distribution system without being treated with alum and hypo in sufficient quantities effectively to remove color and to sterilize the supply.

As a result of the investigation it was concluded in a report dated March 4, 1920, that the former recommendations of this Department, as summarized above, have not been carried out, although the need for them still exists; and that for a short period of time previous to the recent inspection no chemical solutions were being used in connection with the operation of the pressure filters and the plant was not effectually purifying the supply.

It was therefore recommended that the village officials carry out the former recommendations of this Department as soon as possible; that great care be taken to operate the purification plant so as effectually to reduce the organic content and to provide sterilization of the public water supply at all times.

MIDDLEPORT

A reinspection of the public water supply of Middleport was made by Mr. Earl Devendorf, assistant engineer in this department, on October 17, 1920, previous investigations of this supply having been made in 1915 and 1919.

Middleport is an incorporated village located in the eastern part of Niagara county, about 11 miles south of Lake Ontario and about 45 miles west of Rochester. The present population is estimated at 1,600, of which about 75 per cent are served with the public water supply. The water supply is owned by the village and operated under a board of trustees. The public water supply is derived from a shallow well located about 3 miles southwest of the village. The consumption is estimated as between 80 and 150 thousand gallons per day, depending upon the season of the year. The water is pumped into the village distribution system, the excess over consumption going to a steel standpipe 14 feet in diameter and 65 feet in height, having a capacity of 75,000 gallons.

The recent investigation was made as the result of word having reached this office that canal water was again being furnished the consumers in the village due to a shortage of water. At the time of the inspection it was found that water was first pumped beginning September 10, 1920, and has been pumped every other day since. The auxiliary supply is obtained from the overflow of the Barge canal, and is pumped by means of a 16 x 9 x 12-inch Buffalo duplex steam pump having a rated capacity of 750 g.p.m. at 70 r.p.m., into the village distribution system, the excess over consumption going to a standpipe. The pump is located in the basement of the Lin-Del Fruit Company and is maintained as a fire pump. At the time of the inspection the pump had not been used for two days on account of broken valves. New valves had been ordered but had not yet arrived.

While no definite record of operation was kept, it was ascertained from the engineer at the plant that approximately 40,000 gallons of water had been pumped per day, and that the average amount of chlorine used was 2 pounds per day, or approximately 6 p.p.m. The chlorine is applied directly from the cylinder into the suction pipe of the pump, there being no manometer or other means of measuring or indicting the flow of gas other than the tank valve. This is not an entirely satisfactory manner of applying the liquid chlorine as there is no means of varying or controlling the rate of application of the gas with any degree of accuracy. The pump is normally separated from the city mains by a single check and gate valve, and the check valve had been removed in order to make it possible to pump water into the city mains. It was not known how long it would be necessary to continue pumping from the canal into the village mains, but it is expected that as soon as the first rainstorm occurred and relieved the present drought that the municipal supply would be sufficient to care for the needs of the village. The amount of water being pumped from the municipal supply was stated as being approximately 68,000 gallons, indicating that the present consumption is now about 100,000 gallons per day. There are six factories and one school which are the largest consumers. The amount of water used for industrial purposes was not known.

It is proposed to obtain an additional supply of water for the village from Middleport creek. At a point on the stream about 1½ miles south of the center of the village a 20 million gallon storage reservoir is to be constructed. Water from this reservoir is to be purified by means of a slow sand filter plant of approximately 200,000 gallons per day capacity, and forced by pumps through about 5,000 feet of 6-inch castiron pipe to the village distribution system. The pumping is to be maintained against the pressure given by the existing standpipe, the top of which is 104 feet above the proposed pumps. This proposed additional source of supply was approved by the Conservation Commission on March 25, 1920, subject to the condition that the village secure the enactment of rules and regulations for the sanitary protection of the watershed and rigidly enforce the same, and also that the supply be adequately filtered and sterilized.

At the time of the inspection the engineer was informed that the main core wall of the dam for the new reservoir has been completed, but that the village is awaiting a reduction in the market price of castiron pipe before letting the contract for the erection of the pumping station and new pipe line. It is expected that the new supply will be completed and ready for operation by July 1, 1921.

As a result of the inspection it was concluded in a report dated December 29, 1920, that in accordance with the previous recommendations of this Department, the village authorities have taken steps to secure a new public water supply of satisfactory sanitary quality and this supply is now in process of completion; that due to a shortage of the present water supply during the past summer, water from the Barge canal overflow has been pumped after chlorination into the village distribution mains; that the manner of chlorination of the auxiliary supply derived from the overflow of the Barge canal is not entirely satisfactory, in that no apparatus is provided for determining or controlling the rate of application of chlorine.

In view of the above it was therefore recommended that the new public water supply now under construction be completed at as early a date as possible; that when the new supply is completed the purification plant be placed under the supervision of a competent operator and be constantly and carefully operated in order that a public water supply of satisfactory sanitary quality may at all times be furnished; that no water from the Barge canal overflow be pumped into the public distribution system without effective sterilization of the supply, and to this end a chlorination apparatus be installed and effectively operated whenever it becomes necessary to use the Barge canal overflow.

MIDDLETOWN

A reinspection of the public water supply of the city of Middletown was made by Mr. W. J. Erickson, sanitary inspector in this department, on October 27, 1920, a previous inspection of this supply having been made in 1913. Rules and regulations for the sanitary protection of the supply were enacted in 1903.

Middletown is a city of about 18,000 inhabitants located in the west central part of Orange county. It is about 67 miles northwest of New York city, on the Erie railroad. The Middletown State Homeopathic Hospital is located in the northwestern part of the city.

The supply is owned and controlled by the city under the direction of the department of public works, of which Mr. John A. Korschen is commissioner.

The supply is derived from three storage reservoirs, the nearest being about a mile west of the city. The upper reservoir, known as Shawangunk lake, is connected with the lower or Monhagen lake, and forms the source of the Monhagen or low pressure supply. The central reservoir or Highland lake forms the source of the Highland or high pressure supply. The hill section of the city uses the Highland supply, the remainder being supplied from the Monhagen system. The supply is conducted from these reservoirs to the filter plant. From the clear water basin and the pressure filters the water flows by gravity through about 45 miles of castiron mains varying from 24 inches to 4 inches in diameter. There are about 2,600 service mains of which few are metered. The pressure in the mains varies from 35 to 80 pounds per square inch. The average daily consumption from the low pressure system is 2,750,000 gallons, and from the high pressure system 650,000 gallons, or a total of 3,400,000 gallons. When the planned additions and alterations to the filter plant are completed, the increased available supply will make it possible to increase the distribution system without overtaxing the filters.

The low pressure supply is derived from two storage reservoirs or artificial lakes. The upper one, Shawangunk Lake, has a surface area of about 400 acres and a depth of 24 feet, with an estimated capacity of 418,000,000 gallons. This lake, as well as the other two, appears to be largely spring-fed. One small stream, known as the Little Shawangunk kill, is impounded about a mile west of Shawangunk lake and is piped to the lake. Shawangunk lake

also receives the overflow from the middle or Highland lake. From Shawangunk lake the water is conducted to the lower reservoir, Monhagen lake, through 3 miles of 30-inch pipe. The supply either flows into Monhagen lake over an aerating fountain, or may be by-passed directly to the gravity mechanical filters of the low pressure system.

Monhagen lake has a surface area of about 433 acres, with a capacity estimated at about 271,800,000 gallons. It is about 40 feet below the level of Shawangunk lake and about 20 feet above that of the filters. A 16-inch pipe conducts the water to the filters located in a brick building just across the road below the earthen dam which holds the lake water back.

Highland lake, which supplies the high pressure system, is located about two miles from the filter plant. The lake has a surface area of about 341 acres and a capacity estimated to be 517,000,000 gallons. It lies at an elevation of about 80 feet above that of the filters, to which the water is conducted by a 12-inch pipe. A second line has been laid from the lake alongside of the 12-inch line for a distance of 6,000 feet and then shunted with the old line.

The area tributary to the reservoirs is practically all owned by the city, and except for the homes of the caretakers which are so far removed from the lakes as not to endanger the supply, there are no permanent sources of pollution. The watershed of the Little Shawangunk kill is also in a satisfactory sanitary condition. The rules and regulations enacted by this Department are rigidly enforced. Two caretakers patrol the watersheds almost daily. Considerable trouble is experienced from algae growths in the reservoirs which continually clog the filters in summer, making frequent washing necessary. The judicious application of copper sulphate, starting in spring or early summer and continuing throughout the warm season, would tend to retard these growths and thus relieve the filtration plant to a large extent.

The filters are located in a brick building 38 x 130 feet in plan with a small wing 50 x 16 feet. The gravity filters are located in one side of the main building. At present there are eight units. The four original 14-foot cylinder cypress tank filters installed in 1900 are to be removed, and six additional Continental–Jewel filters, similar to those installed in 1908, placed in operation. These tanks are 11 x 16 feet inside and have 12-inch walls. The strainer system consists of 33 parallel rows of laterals from a 6-inch header. Those laterals are each tapped for ten ⅝-inch Continental–Jewel strainers. Over the strainers there is 9 inches of graded gravel in three layers and about 27 inches of sand. The filters are operated under a head of 28 inches. A fairly constant level is maintained by a valve over the influent line which is operated by a float. The inner walls are lower than the bounding walls, and when one filter overflows it overflows into the others. The filters are cleaned when they begin to overflow. This is done by reversing the flow. After the influent pipe has been closed and the head drawn to the gutters, air is blown through the bed for five minutes, then wash water for five minutes, then air again for five minutes and finally wash water until the bed is clean. The first filtrate is wasted. Ordinarily all filters are not operated at one time except when there is a vigorous growth of algae in the reservoirs, at which times all units must be placed in service because of the rapid clogging. The capacity of these units is half a million gallons per day for each unit. The total area of the present plant is about .0334 acres. The rate of filtration is therefore about 85,000,000 gallons per acre per day.

The coagulant tank is placed high over the filters so as to raise the orifice higher than the level of Monhagen lake. A small platform supported by two rafters carried two cylindrical cypress tanks provided with valves with glass ball floats. These tanks discharge into a rectangular tank also provided with glass ball floats. The discharge orifice is fitted with interchangeable calibrated ring weirs. Sulphate of alumina is used for the coagulant, and is dissolved in a small cylindrical tank and raised by water pressure to the storage tanks. About .8 of a grain is applied per gallon filtered, the exact amount depending upon the character of the raw water. The apparatus had become cloged just previous to the time of the inspection and no alum was being applied.

A clear water basin, 74 feet long, 36 feet wide, and 6 feet deep, having a capacity of 100,000 gallons, is located below the filter house. An additional

clear water basin with a capacity of 250,000 gallons was being constructed just south of the filter plant.

Four horizontal steel tank pressure mechanical filters 8 feet high by 10 feet long are provided for treating the water of the high pressure supply. These filters are operated under a head of 80 feet, the difference between the filters and that of the level of Highland lake, the source of the raw water supply. The strainer system is similar to that in the gravity filters. Above the strainer system is a 6-inch layer of gravel and 24 to 30 inches of sand. The filters are washed when the loss of head in the tank reaches 10 pounds, using a method similar to that in washing the gravity filters. Usually they are washed once in 24 hours. To meet the needs of an increasing consumption, two additional units, similar to those already in use, will be installed. The capacity of these units is about 250,000 gallons per 24 hours. The total area of the present pressure filters is about .0073 acre based on the length and diameter of the cylinder. The present rate of filtration is therefore about 89,000,000 gallons per acre per day.

The coagulant for the pressure filters is applied by the Shunt current method through a castiron drum, the rate being regulated by the valves of the Shunt circuit. An average of about .8 grain of alum is applied per gallon of water treated.

When the additions to the filter plants are completed the area of the gravity filters will be increased to about .04 acre, and the yield increased to 5,000,000 gallons per day assuming 125,000,000 gallons per acre per day. The area of the pressure filter plant will be increased to about .011 acre. Making the above assumptions, the available yield may be estimated at 1,375,000 gallons per day. The total available yield for the plant would then be 6,375,000 gallons per day.

Chemical and bacterial analyses of both the raw and filtered water are made monthly by the city chemist in order to determine the efficiency of the operation of the plant.

From the results of this inspection it was concluded in a report dated November 26, 1920, that the supply was as free from sources of contamination as is possible for a surface supply, and is subject only to possible pollution by animals or visitors on the watershed; that the City of Middletown has taken commendable action in acquiring the watersheds by purchase and freeing them from permanent sources of contamination; that the rules and regulations are being strictly enforced; that in general the filtration plants are operated efficiently though at the time of the inspection, due to the temporary clogging of the alum feed pipe, no alum was being applied to the raw Monhagen water before filtration. It was therefore recommended that the department of public works continue to maintain the watersheds in a sanitary condition at all times, and that the filtration plant be continuously operated in an efficient manner.

The water of this supply is used by the Erie, the New York, Ontario and Western, and the Middletown and Unionville Railroads. Data regarding the supply were furnished to the United States Public Health Service on November 29, 1920, and included, in addition to the results of the analyses of samples of the water, the statement that at the time of the inspection the conditions surrounding the supply were satisfactory, and that the results of the inspection and the analyses of the samples, together with the results of previous inspections and analyses, indicate that the water was of satisfactory quality for human consumption. A copy of the report accompanied this data.

MIDDLEVILLE

A reinspection of the public water supply of the village of Middleville was made on October 21, 1920, by Mr. A. I. Howd, assistant engineer in this Department, previous investigations of this supply having been made by the Engineering Division in 1910, 1916, and 1918. Rules and regulations for the

sanitary protection of the reservoirs and tributaries thereto of the water supply of the village were enacted by the Department in 1902.

Middleville has a population of about 710, and is located in Herkimer county, about 9 miles north of Herkimer. Of the total population, about 90 per cent are served with water from the public water supply. The waterworks are owned and operated by the municipality, under the direction of a board of water commissioners of which Mr. H. E. Jackson is president.

The water supply is derived from Kenyon brook, the intake being located about 2 miles northeast of the village. The water flows from the intake reservoir to a large storage reservoir having a capacity of about 21,000,000 gallons, from which it is delivered by gravity through a distributing system consisting of about 2½ miles of mains ranging from 4 to 6 inches in diameter. The pressure in the village is approximately 160 pounds per square inch. There are about 120 service taps, one of which is metered. There is no accurate method of estimating the water consumption of the village. In general, the details of the waterworks system remain as described in the previous report. In accordance with previous recommendations of this Department, the intake reservoir has been cleaned and the mains in the village are flushed several times a year. As far as could be learned, no action had been taken on other recommendations.

The watershed above the point of intake has an area of about ½ square mile, on which is located two farms. A highway runs practically the entire length of the watershed, and another highway crosses the stream about a mile above the intake. The water supply is subject to accidental and willful pollution from inhabitants, visitors, and animals upon the watershed.

At the factory of E. C. Mills Leather Co., Inc., there are two cross connections between the public water supply of the village and the fire protection and industrial system of the plant. A 6-inch connection from the village mains passes around the north side of the factory for the yard fire protection system. There is a single check valve on this connection near the street main. A 6-inch lateral is run from the connection into the factory, and there is a single check valve on this lateral in the basement of the factory. On a 3-inch riser from the lateral there is a gate above which the water is pumped into the riser from the West Canada creek, the water being used principally to operate elevators. The other connection between the public water supply and the industrial supply of the factory is through a tap on the south side of the factory. A single check valve and gate are located on the connection near Bridge street. Inside the factory, before the connection is made with the industrial supply, there is a gate, a meter, and a single check valve in succession. While this arrangement is fairly satisfactory, it cannot be considered absolutely safe. The connection between the public water supply mains and the industrial supply mains should be provided with gates, double check valves, gauges, and test valves, and should be readily accessible for inspecting and testing. The gates, valves, and other appurtenances should be installed in a suitably constructed manhole located at a convenient and readily accessible point outside of any building and near the municipal main.

As a result of the reinspection of the public water supply of Middleville, it was concluded that the authorities in charge of the water supply have in part carried out the recommendations of the previous report of this department: that the public water supply is subject to accidental and willful pollution from inhabitants, trespassers, and animals upon the watershed; that the public water supply is subject to possible contamination from the cross connections with a polluted industrial supply at the E. C. Mills Leather Co., Inc., and that the arrangement of the gates and check valves on this cross connection is not in accordance with the general plan approved by this Department.

It was therefore recommended that the diverting ditch around the reservoir be cleaned, as previously recommended by this Department; that the village authorities make regular, frequent, and effective inspections of the watershed and strictly enforce the rules and regulations enacted by this Department for the sanitary protection of the supply; that the village authorities consider

the installation and operation of an apparatus for the sterilization of the supply with liquid chlorine; that the connection between the public water supply mains and the industrial supply mains be provided with gates, double check valves, gauges, and test valves in accordance with the general plan approved by this Department.

MILLERTON

A reinspection of the public water supply of Millerton was made by Mr. W. J. Erickson, engineering assistant of this Department, on May 29, 1920, a previous inspection having been made in 1917.

Millerton, which is a village of about 900 inhabitants, is located in the northeastern part of Dutchess county, about 60 miles southeast of Albany. About 90 per cent of the inhabitants use the public water supply which is owned and controlled by the village under the direction of a board of water commissioners. The water supply is derived from a spring near the head of a small brook about a mile west of the village, from the brook itself, and from a well located in the northwestern part of the village. The water from the spring and brook is collected in a small impounding reservoir from which it flows through a distribution system consisting of about 3 miles of mains ranging from 4 to 8 inches in diameter. There are about 300 service taps, of which only 13 are metered. The water consumption is estimated at 105,000 gallons per day in winter and 125,000 gallons per day in summer. The pressure in the village averages about 95 pounds per square inch. The well supply is pumped directly into the distribution system.

The spring is developed by the construction of a concrete basin in the bed of the brook from which the water is conducted by castiron pipe to the impounding reservoir 1,000 feet below. A concrete trough carries the stream over the spring and this prevents the water of the stream from entering the spring. The brook water runs to a small concrete intake basin provided with a ½-inch mesh screen from which a 3-inch pipe diverts part of the brook water into the impounding reservoir. The reservoir is formed by a small dam across the natural bed of the brook and has a capacity of about 300,000 gallons.

The watershed is about 50 acres in area. The area in the immediate vicinity of the spring and reservoir is owned by the village and is fenced. The area above the spring is used for pasturage.

The well supply is derived from about 10 drilled wells 20 feet deep. The strata consists of 18 feet of gravel and 18 inches of clay below which lies a water bearing gravel. The general conditions around the well were satisfactory at the time of the inspection.

As a result of this inspection it was concluded that the brook supply is subject to some pollution from pasture land on the watershed; that the spring is apparently adequately protected, and that the area in the vicinity of the well is in a sanitary condition.

It was therefore recommended that the village purchase or obtain the control of additional lands in the vicinity of the brook above the spring in order to prevent pollution of the water by cattle on the watershed, and that the area in the vicinity of the well be kept in a sanitary condition at all times.

The water of this supply is used by the Central New England Railroad for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on October 18, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were fairly satisfactory, and that the results of the inspection and the analyses of the samples, together with the results of previous inspections and analyses, indicate that the water was of doubtful sanitary quality for human consumption, and that certain improvements should be made. A copy of the report accompanied this data. Based on this information the United States Public Health Service, on November 11, 1920, issued a provisional certificate permitting the temporary use of the water for drinking and culinary purposes in interstate traffic.

MINEOLA

A reinspection of the public water supply of the village of Mineola was made by Mr. Alfred Mullikin, assistant engineer in this Department, on June 9, 1920, a previous inspection of this supply having been made in 1915.

Mineola is located in the southern part of the town of North Hempstead, about 21 miles from New York city. The population is estimated at 3,000. Of the total population, 90 per cent are served with water from the public water supply. The waterworks are owned and operated by the municipality under the direction of the board of trustees. The water supply is derived from two driven wells located in the eastern part of the village. From the wells the water is pumped through a distribution system consisting of 8 miles of castiron pipe ranging from 4 to 8 inches in diameter. An elevated steel water tank, 22 feet in diameter and 28 feet high, has a capacity of about 100,000 gallons and acts as an equalizing reservoir, maintaining a pressure of from 65 to 70 pounds per square inch in the municipality. There are 745 service taps, or which 600 are metered. The average daily water consumption is approximately 266,600 gallons, or 76 gallons per capita. This amount includes the water which is furnished to a population of about 800 in the village of East Williston. In general, the details of the waterworks system remain as described in a previous report.

The two driven wells are 12 inches in diameter and 80 feet and 91 feet deep respectively. The strata through which the wells pass are sand and gravel. The area occupied by the wells and pumping station are surrounded by houses but the most thickly settled section is west of the plant. The houses on this side of the wells are about 150 feet away and are generally provided with privies. The sewage from the toilet of the pumping station enters a brick cesspool located 50 feet south of the plant. The Oyster Bay branch of the Long Island railroad runs within 50 feet of the wells.

From the recent inspection it appears that the authorities have not carried out all of the recommendations set forth in our previous report, such as providing impervious cesspools and watertight containers for all privies within 500 feet of the wells; that regular analyses of the water have not been made; and that a complete sewerage system has not been installed to take care of the sewage from properties in the vicinity of the wells. A solution feed manual control Wallace & Tiernan chlorination apparatus has been installed but has been out of operation for two months.

As a result of the reinspection of the public water supply of Mineola it was concluded that the authorities in charge of the water supply have only in part carried out the recommendations of our previous report; that the water supply was of a relatively satisfactory sanitary quality at the time of inspection; that the chlorination apparatus was out of order, and that there remained several opportunities for serious contamination of the water at times of heavy draft on the wells.

It was therefore recommended that the chlorination apparatus be put in operation and chlorine applied to the water continuously at a rate of not less than .2 parts per million; that a duplicate chlorination apparatus be installed; that frequent tests of the chlorinated water for excess chlorine be made; that the village authorities carry out at once such of our previous recommendations as have not been acted upon; and that after the construction of a sewerage system all privies and cesspools be properly cleaned and abandoned.

MONTICELLO

A reinspection of the public water supply of the village of Monticello was made by Engineering Assistant W. J. Erickson on May 13, 1290, a previous inspection of this supply having been made in 1918.

Monticello, an incorporated village with a population of about 2,200, is located in the central part of Sullivan county. Practically all of the popu-

lation is served by the supply. The waterworks are owned by the village and operated under the direction of the board of water commissioners.

The water supply is derived from Kiamesha lake, about 1½ miles north of the village. From the lake it is pumped directly into the distribution system, consisting of 14 miles of mains varying from 3 to 8 inches in diameter, the excess over consumption being stored in an open standpipe which maintains a pressure of about 60 pounds per square inch in the village. There are about 575 taps of which about 100 are metered. The consumption varies from 223,000 gallons per day in the winter to 400,000 gallons per day in the summer. The average consumption is about 300,000 gallons per day. At the time of the inspection the water system was practically the same as at the time of the previous inspection. A new suction well was being constructed at the pump station and one of the pumps was being overhauled. The walls at the station were badly cracked, and it was stated that they are to be repaired. The equipment of the pumping station is the same as described in the previous report.

Kiamesha lake has a watershed area of about ¾ of a square mile and a surface area of 140 acres. Due to the heavy influx of summer visitors to the hotels and boarding houses along the lake, the population on the watershed during the summer season reaches about 2,500 per square mile. Most of the larger hotels and boarding houses are provided with fairly satisfactory means of sewage disposal, but at times the lake receives gross pollution (especially along the northern shore) from surface drainage and overflowing cesspools. The unsatisfactory sewage collecting basin mentioned in the previous report has been replaced by a substantial concrete one. From this basin the sewage is continually being pumped to a point on the other side of the hill not on the watershed of the lake. At the time of the inspection the majority of the hotels and boarding houses had not yet been opened for the summer season, and the pollution of the lake from these sources could not be observed. In addition to the sewage pollution, the water of the lake undoubtedly receives considerable pollution from the surface drainage of the thickly populated district and from the boating and bathing in the lake.

In our previous report it was recommended that the village give consideration to a modern filtration plant supplemented by chlorination; that pending the installation of a filtration plant an apparatus for the chlorination of the supply be immediately installed and put in operation, and that a competent engineer be retained to study the whole problem. From the present inspection it appears that none of these recommendations have been carried out.

From these considerations it was concluded that the recommendations of our previous report have not been carried out; and that, though conditions have slightly improved, the supply is still subject to dangerous pollution from the population on the watershed, largely campers and summer boarders, and from pleasure seekers on the lake itself, and cannot be considered of a safe sanitary quality.

It was therefore recommended that the village authorities immediately install an apparatus for the treatment of the water supply by liquid chlorine, and apply chlorine continuously and at all times in such amounts as effectively to sterilize the water; that the village authorities take steps to have the rules and regulations enacted by this department for the protection of the supply strictly enforced; that the village authorities consider the installation of a modern water treatment plant, or the development of a new source of supply; that a competent engineer be employed to study the whole problem as to the most practical and economical method of obtaining a water supply of adequate amount and at all times of a safe sanitary quality, either by improving the present supply or by the development of a new source.

The water of this supply is used by the New York, Ontario and Western Railroad for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health

Service on October 18, 1910, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were found to be unsatisfactory, and that the result of the inspection and analyses of the samples, together with the results of previous inspections and analyses, indicate that the water cannot be considered of satisfactory quality for human consumption until the water is properly treated as recommended. A copy of the report accompanied this data. Based on this information the United States Public Health Service on November 11, 1920, issued a certificate stating that the use of the water for drinking and culinary purposes in interstate traffic was not permitted.

MORRISVILLE

A reinspection of the public water supply of the incorporated village of Morrisville, Madison county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on June 18, 1920, previous inspections of this supply have been made by this Division in 1917 and 1918.

Morrisville, a village with a present population estimated at 600, is located in the valley of Callihan brook, about 2½ miles west of the Morrisville station on the New York, Ontario and Western railroad, which station is 16 miles south of the city of Oneida. Of the total population, practically all are served with the public water supply. The waterworks are owned and operated by the municipality under the direction of the village board of trustees.

The water supply is derived from a reservoir located about ¾ of a mile from the village. From the reservoir the water is delivered by gravity to the distribution system, consisting of about 2½ miles of castiron pipe ranging in size from 4 to 10 inches in diameter. The average pressure in the municipality is approximately 86 pounds per square inch. Of the 150 service taps, all are metered with the exception of a few public taps and water motor connections. The average daily water consumption is approximately 24,000 gallons per day, or 40 gallons per capita per day. Storage is provided by the above mentioned reservoir. The general details of the waterworks system remain as described in the previous reports.

The watershed tributary to the supply contains about 60 acres and consists of uninhabited agricultural area. Opportunities for indirect pollution of the water supply by surface wash from the highway passing about 100 feet to the north of the reservoir were found. In our previous reports it has been recommended that the village authorities continue very careful supervision of the sanitary conditions of the reservoir and watershed, and that copper sulphate be applied to overcome the growth of algae which appears at times in the water. At the time of the recent inspection it was not learned that the application of copper sulphate has been attempted.

It was therefore recommended in a report dated September 10, 1920, that the municipal authorities in charge of the water supply carry out at once such of our previous recommendations as have not as yet been acted upon; that the village authorities exercise continual care to maintain the ditches intended to divert the surface wash of the highway in an effective condition.

MOUNT VERNON

An investigation of the sanitary condition of the water supply of the city of Mount Vernon was made by Mr. Henry Ryon, assistant engineer, on April 9, 1920. The investigation was made subsequent to an outbreak of typhoid fever in that city.

The water supply of the city of Mount Vernon is furnished by the New York Interurban Water Company of Mount Vernon, which also furnishes water to the village of Mamaroneck, town of Harrison, and to districts of

Orienta and Rye Neck. The supply of the company is obtained from three separate sources: The Mamaroneck river, the Hutchinson river, and Tom Paine brook.

The Mamaroneck river above the company's reservoir has a watershed containing about 12.8 square miles. This area has a population estimated at about 2,000, located principally in the northern portion of the watershed which lies in the village of White Plains. Although there appears to be no direct pollution of the river from permanent sources, the stream receives the runoff from this populated district which undoubtedly contains considerable polluting matter and is of course subject to accidental pollution. All the water from this source is treated at the Mamaroneck plant before being discharged into the mains.

The Hutchinson river watershed above the company's reservoir and intake of Pelham has an area of 2 square miles and has a population of about 400. The stream receives the street wash and surface drainage from this district, undoubtedly containing much polluting matter. One of the Mount Vernon sewers carrying considerable sewage passes close to the stream and apparently had recently overflowed allowing considerable volume of sewage to pass directly into the river. The water of the Hutchinson river is collected in the reservoir at North Pelham and treated at the North Pelham plant before being discharged into the mains.

The Tom Paine brook has a watershed of about 1.9 square miles and a population estimated at about 150. This area receives less pollution than the watersheds of either of the other sources, but the water is not satisfactory for use as a public water supply without proper treatment. The water is collected in a Mahlsted reservoir and siphoned to the Pelham plant where it is treated with the Hutchinson river water before being pumped into the mains. Rules and regulations for the protection of the water supply of Mount Vernon were enacted by this Department in 1907.

At the Mamaroneck plant the water is treated by coagulation, chlorination and filtration through rapid pressure filters. The water flows from a small reservoir one mile north of the village of Mamaroneck to a 500,000 gallons coagulation basin, alum being applied to the water as it enters the basin. The water then flows to the pump well where liquid chlorine is applied at a rate of from .2 to .4 parts per million. From the pump well the water is discharged into the mains through 4 pressure mechanical filters operated in parallel. The average rate of filtration based on the average flow of 2,235,000 gallons per day was about 130,000,000 gallons per acre per day. The filtered water is discharged into a 16-inch main leading to Mamaroneck, Harrison, and Mount Vernon.

At the Pelham plant the Hutchinson river and Mahlsted reservoir water is treated by slow sand filtration and chlorination. With the average flow of about 1,400,000 gallons per day, the rate of filtration is about 1,200,000 gallons per acre per day. Chlorine is applied to the filtered water as it passes through the suction to the pumps by a Wallace & Tiernan solution feed apparatus, chlorine being applied at the rate of about .34 parts per million. The pumps discharge into the 16-inch main from the Mamaroneck supply.

The distribution system of the company consists of about 80 miles of cast-iron pipe varying from 4 to 16 inches in diameter. A standpipe located in the southeastern part of Mount Vernon takes the surplus water.

From the above facts it was concluded that the raw water from the streams used by the New York Interurban Water Company is not suitable at any time for human consumption without proper treatment; that no tests are made to determine the exact quantity of alum and chlorine needed for the varying quality of the raw water; that owing to laxity of supervision of the Mamaroneck plant at Mamaroneck, polluting matter passed through the plant and reached the mains, and that cases of typhoid fever which occurred in Mount Vernon, Mamaroneck, and Harrison, were apparently due to pollution from the Mamaroneck watershed passing through the treatment plant and reaching the consumers. It was therefore recommended that the water company continue the careful supervision of the watersheds and reduce the sources of contamination to a minimum; that they make daily tests of the

raw and filtered water to determine the exact quantity of alum and chlorine needed; that the chlorine cylinder connections be so arranged that two cylinders may be kept connected to the apparatus at all times; and that the company exercise more careful supervision over the operation of the filtration and chlorination plants.

NEW BERLIN

A reinspection of the public water supply of the village of New Berlin, Chenango county, N. Y., was made by Mr. N. H. Baier, sanitary inspector in this Department, on November 23, 1920, previous inspections of the supply having been made by this Division in 1913 and 1919.

New Berlin is located on the Chenango river, in the northeastern part of the town of New Berlin. The present population is 1,140, of which practically all are served by the public water supply. The waterworks are owned by the village and are under the control of the board of trustees, of which Mr. E. D. Talbot is president, and Mr. H. Hill is superintendent.

The water is derived from Howard brook and springs, located 1½ miles east of the village. The water from the brook is impounded in a large, open reservoir, from which it flows by gravity through a 14-inch main to a socalled spring reservoir located about 400 feet west of the large reservoir. The water from the springs enters at one end of the spring reservoirs through open masonry work. There is a chlorinating plant about one-half mile west of the large reservoir, from which the water passes by gravity through a distributing system consisting of some 4 miles of castiron pipe ranging from 4 to 10 inches in diameter. The pressure varies from 37 to 120 pounds per square inch, with an average of 110 pounds per square inch. Of the 300 service taps none are metered. There are 35 fire hydrants in the village. The average domestic consumption, as estimated at the time of the installation of the chlorinating apparatus, is one-fourth million gallons, or 220 gallons per capita per day. The village has no sewerage system, being served by cesspools, privies, and private sewers, the latter discharging either into Paper Mill brook, a tributary of the Unadilla river, or directly into the river.

The 14-inch intake pipe at the large reservoir is near the gate house and located at the bottom of the reservoir at a depth of some 20 feet. Trouble is often experienced with algae growths in the large open reservoir. This has been overcome either by adding copper sulphate or by drawing off all the water of the reservoir into the brook. The spring reservoir, which is covered by a wooden roof, is divided into two parts: The Howard brook end, which is of concrete, and 30 feet x 60 feet in plan and 5 feet 4 inches deep; and the spring fed part, which is of open masonry, 25 feet x 60 feet in plan and 5 feet deep, giving a total capacity of 128,000 gallons. There is an equalizer pipe so that the water in the two parts combine before being delivered to the mains.

A Wallace & Tiernan chlorinating apparatus was installed in June, 1920. With the 1½ pulsations per minute noted at the time of the inspection, and on a basis of 250,000 gallons per day, the rate of application of chlorine was 0.23 p.p.m. The exact amount of chlorine to be added depends, however, on the organic matter in the water to be chlorinated, and it is generally desirable to determine the proper amount by frequent tests for excess chlorine, instructions for making which are issued by this Department.

From the recent investigation made it appears that the recommendations set forth above have been partially carried out. A chlorination plant has been installed to sterilize the present supply, but no steps have been taken either to procure a new supply, adequate in quantity and satisfactory in quality, or to construct a filter plant properly to treat their present supply. Although proper sterilization destroys practically all pathogenic bacteria, it does not affect the physical quality of a water. Since the supply is taken from a source apparently subject to gross pollution at times, it would seem desirable that a filtration system should be installed to treat the water.

As a result of the reinspection of the public water supply of New Berlin it was concluded that the public water supply was not of entirely satisfactory sanitary quality at the time of the inspection; that the chlorinating apparatus recently installed is not effectively sterilizing the water supply; that the village authorities have only partially carried out the previous recommendations of this report. It was therefore recommended that the village authorities apply chlorine to the water continuously and in sufficient quantity effectively to sterilize it; that frequent tests be made of the chlorinated water for excess chlorine in accordance with the directions issued by this Department, and the rate of application of the chlorine be regulated in accordance with the results of the test; and that the village authorities either remove all sources of pollution on the watershed or install a modern filtration plant.

NIAGARA FALLS

A reinspection of the water supply of the city of Niagara Falls was made on March 19, 1920, by Mr. Earl Devendorf, assistant engineer. Previous inspections of this supply were made by this Department in 1907, 1915, and 1916.

Niagara Falls is a city of some 60,000 inhabitants located at the site of Niagara Falls on the Niagara river. There are two public water supplies in the city, one owned by and operated under the direction of the Western New York Water Company, and the other owned by and operated under the direction of the city authorities.

The supply furnished by the Western New York Water Company is derived from the intake canal of the Niagara Falls Power Company, and the purification and pumping plant is located in the southern part of the city on the banks of the canal adjacent to the intake. Water is pumped, after preliminary sterilization by liquid chlorine, from the intake well into a coagulating basin, and flows by gravity through 14 mechanical gravity filters into a clear water well. From the clear water well the water is pumped, after secondary sterilization with liquid chlorine, into the distribution system. The excess over the consumption goes to a steel standpipe 40 feet in diameter and 80 feet in height, having a total capacity of 750,000 gallons. Approximately 25 per cent of the total population of the city is served with this supply. The average total daily consumption during 1919 was 8,091,879 gallons.

Sulphate of alumina is introduced into the raw water as it enters the coagulating basin in various amounts ranging from a minimum of .47 to a maximum of 3.5 grains per gallon depending upon the turbidity of the raw water. This basin has a capacity of 500,000 gallons giving a period of sedimentation from 1.79 to 1.22 hours. The filters are operated with 3 to 3½ feet of water over the sand. Under normal conditions the filter run varies from 12 to 20 hours. At the time of the inspection, however, the run was much shorter, it being necessary to wash the filters about every 4 hours. The filters are washed when the loss of head is equal to 7 feet. The average amount of wash water used is equivalent to 6.4 per cent of the filtered water. After washing, the filtered water is wasted for approximately 10 minutes. The average amount of liquid chlorine used per million gallons for the year 1919 was 2.57 pounds, of which approximately 2 pounds was applied before filtration. The average rate of filtration was 103,000,000 gallons per acre. and ranged from a minimum of 95,000,000 gallons per acre to a maximum of 150,000,000 gallons per acre per day.

At the time of the inspection the matter of cross-connections of the public water supply system with auxiliary fire supplies was taken up. It was learned that at the manufacturing plants of the Carborundum Company, Oldberg Electro-Chemical Company, Niagara Alkali Company, and the National Electrolytic Company, there are cross-connections existing between the public mains and private mains used for fire purposes, which mains are supplied with raw water from the Niagara river and the Power canal. In

all of the above plants there are double check valves installed to prevent any raw water from entering the mains of the public supply; and in addition, gate valves with indicator parts are provided in two of the plants, namely the Carborundum Company and the National Electrolytic Company. In all cases the two systems should be separated by gate valves in addition to the double check valves according to the plan approved by the Board of Underwriters.

It was therefore recommended that all existing cross connections between the city mains and private fire lines be equipped with double check and gate valves in accordance with plans approved by this Department, and that the filtration plant be operated with care and efficiency and under careful supervision in order that a supply of satisfactory sanitary quality be furnished to the consumers at all times.

The water of this supply is used by The New York Central Railroad Company for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on December 18, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were fairly satisfactory, and that the results of the inspection and the analyses of the samples, together with the results of previous inspections and analyses, indicate that the water was of satisfactory quality. A copy of the report accompanied this data.

The municipal water supply of the city is obtained from the Niagara river at a point about 2 miles north of the main portion of the city, through an intake extending some 2,200 feet from shore. The water is conducted to a pump well located on the bank of the river near the pumping station, from which it is lifted to the coagulation basins at the filter plant. The water is treated with alum, applied at a rate of about 0.4 grains per gallon, before entering the basins. From the coagulation basins the water flows by gravity to 16 14½ by 25 feet mechanical gravity filters, from which it is discharged into the clear water basin. The filter effluent is sterilized by means of hypochlorite of lime, applied at the average rate of about 3.16 pounds per million gallons. From the clear water basin the water is forced into the distribution mains, consisting of about 90 miles of castiron pipe varying from 4 to 36 inches in diameter. The average consumption is about 12,000,000 gallons per day.

On the morning of February 25, 1920, a break occurred in the mains, and due to heavy drought it became necessary to supplement the filtered water by raw water until February 27. The amount of raw water used never exceeded 18 per cent of the total pumpage. During this period the amount of hypochlorite applied to the water was increased to avoid any possibility of pathogenic bacteria reaching the consumers.

As a result of the inspection it was concluded that the introduction of raw water into the clear water well and thus into the distribution system between February 25 and 27, 1920, was unavoidable, and that during this period the rate of application of hypochlorite was so increased as effectively to sterilize the supply, and that the plant was being carefully operated under scientific laboratory control. It was accordingly recommended that the authorities continue, as in the past, to operate the plant under careful supervision in order to secure a water of satisfactory sanitary quality at all times.

NORTH BANGOR

An investigation of the water supply of the village of North Bangor was made on November 20, 1919, by Mr. A. I. Howd, inspecting engineer.

North Bangor is an incorporated village having a population of about 500, located in the northwestern part of Franklin county, in the town of Bangor. The waterworks are owned by the North Bangor Water Company, Inc. The supply is derived from springs about 1¾ miles east of the village, from which the water flows by gravity to the village.

A concrete reservoir 10 feet by 14 feet by 12 feet deep, with a natural earth bottom, is located over the springs and acts as a collecting basin. The concrete side walls rise to a height of 2 to 3 feet above the ground surface, and an overflow pipe is provided at height of 8 feet above the bottom of the reservoir. The reservoir is covered with a small frame building. A 6-inch intake located near the center and bottom of the reservoir is covered by a ¼-inch mesh copper screen. The water flows from the intake by gravity directly into the distribution system.

The reservoir is located about 20 feet south of the state highway running between Malone and North Bangor. A ditch between the road and reservoir carries off the drainage from the road and land adjacent. The land in the vicinity of the springs consists principally of uncultivated open field with a small wooded portion near the springs. About ½ acre of land around the spring is owned by the water company. The nearest building is about 300 feet distant from the springs and at a slightly higher elevation. There were no apparent sources of direct or continuous contamination of the springs or reservoir at the time of the inspection.

The water company owns another spring located on the north side of the highway a short distance east of the reservoir. A concrete wall, built up around this spring forms a basin 6 feet by 6 feet by 9 feet deep, which is provided with a loose plank cover. This spring is located about 30 feet from the state highway and about 200 feet from the nearest house. The spring is not used for public water supply purposes and is not connected in any way with the distribution system.

As a result of the inspection it was concluded that the public water supply of North Bangor is derived from a source which should ordinarily furnish a water of a satisfactory sanitary quality, and it was therefore recommended that the North Bangor Water Company continue to exercise careful supervision over the water supply and make regular and frequent inspections of the springs and reservoir.

NORTH TARRYTOWN

An investigation of the water supply furnished by the Consolidated Water Company of Suburban New York to the villages of North Tarrytown, Ardsley, Dobbs Ferry, Hastings, and Scarsdale was made on August 31 and September 1, 1920, by Mr. Henry Ryon, assistant engineer.

The villages supplied with water by the Consolidated Water Company of Suburban New York are located along the east shore of the Hudson river in Westchester county, from 20 to 25 miles north of New York city. The total population served is approximately 20,000, and the consumption about 3,000,000 gallons per day, or 150 gallons per capita per day. The distribution system consists of approximately 85 miles of castiron mains varying from 4 to 16 inches in diameter, on which there are approximately 2,600 service taps, two-thirds of which are metered. The main supply is derived from the Pocantico river at Pocantico lake. There is, however, a connection to the Croton Aqueduct of New York City's supply at Ardsley, from which water can be taken in case of necessity. The water from Pocantico lake is coagulated, filtered, and chlorinated before being delivered into the mains, and that from the auxiliary supply from the Croton Aqueduct treated with liquid chlorine when used. In addition to the storage in Pocantico lake, which has a capacity of about 383,000,000 gallons, there are three reservoirs: the first, known as the high service reservoir, located a short distance north of the Pocantico station, having a capacity of about 11,000,000 gallons; the second, the Metz farm reservoir, with a capacity of 4,000,000 gallons; and third, the Ardsley standpipe, with a capacity of 60,000 gallons; making the total storage capacity a little less than 400,000,000 gallons.

The watershed tributary to the reservoir has an area of approximately 12½ square miles. There are about 100 houses on the area, most of which are at a considerable distance from the river and its tributaries. There are two sewage disposal plants on the shed—one serving Briarcliff Manor

and consisting of settling tanks, a pumping station, and absorption trenches; the other serving St. Joseph's School at Pocantico Hills and consisting of settling tank and subsurface irrigation field. Neither of these two plants discharges its effluent directly into the Pocantico river or its tributaries, and when properly operated the plants cannot be considered as affecting in any way the sanitary quality of the water supply. At Briarcliff Manor, however, some difficulty has been experienced in the past by the overloading of the pumping station after heavy rains, resulting in the direct discharge of settled sewage into the tributaries of the lake. During the present summer, in order to overcome this difficulty, an additional pump has been installed and additional absorption trenches constructed, which make it possible to dispose of all the sewage reaching the plant, even at times of maximum flow, without danger of any sewage or effluent reaching the stream without passing through the soil.

On the south side of a small stream entering the east side of the reservoir, about ½ a mile above the dam, there are two dwellings with the usual accessory buildings, which with the ground around them are not kept in an entirely satisfactory condition. The ground immediately adjacent to the buildings and sloping toward the streams shows evidence of considerable pollution. The sanitary arrangements, however, comply with the rules and regulations enacted for the protection from contamination of the water supply furnished by the Consolidated Water Company of Suburban New York to North Tarrytown and the other villages. The conditions at the time of the present inspection were considerably better than at the time of the previous inspection. It is understood that the property has recently changed hands and it is hoped that the new owner will keep the premises in better condition.

The treatment plant and pumping station of the company is located immediately below the dam, and the water is here treated with alum, allowed to stand in the coagulation basin, filtered through pressure mechanical filters, chlorinated, and pumped into the distribution mains.

Under normal conditions the water flows by gravity from the dam to the chemical house, where alum is applied to it at the rate of about 400 pounds per day, or about 0.9 of a grain per gallon. From the chemical house the water passes to the coagulation basins, which are two in number, each 38 by 90 feet in plan and 12 feet deep, making the total capacity approximately 600,000 gallons, the equivalent of approximately four hours average flow. Each basin is divided by a longitudinal wall which causes the water to flow from the point of entrance to the opposite end and back again to the outlet located opposite the inlet. The basins are operated in parallel. At the time of the inspection a very satisfactory flow existed in the basins. The basins are located at such an elevation that at times of extreme low water their flow line is above the level of the water in the lake. To provide for this condition, which only occurs at infrequent intervals, two 3,000,000 gallon steam driven centrifugal pumps have been installed in the pumping station to lift the water from the reservoir to the chemical house and coagulation basins.

From the coagulation basin the water flows to the filters which consist of six horizontal pressure mechanical units, each about 20 feet by 8 feet in size and having a rated capacity of 500,000 gallons per day. With an average water consumption of 3,000,000 gallons per day, the rate of filtration through these filters is about 110,000,000 gallons per acre per day, a rate which should give satisfactory results. The filters are said to be flushed once each day on the average, although at times when the turbidity of the water and the quantity of alum applied is higher than usual they are of course washed more frequently. No instruments have been installed for measuring the loss of head through the filters, nor is there any apparatus for controlling the rate of filtration except the automatic valve which maintains a constant head on the coagulation basin. It would seem desirable that suitable gauges should be installed for indicating the loss of head through the filters, thus giving an idea of their condition and facilitating

their operation. The suction of the pumps connect directly to the main effluent pipe from the filters, thus making the total head on the filters the gravity head due to the elevation of the coagulation basin above the filters plus the vacuum on the suction of the pumps.

A Wallace and Tiernan manual control chlorination apparatus is provided for applying chlorine to the filtered water and is connected to the suction pipe between the filters and the pumps just mentioned. At the time of the inspection the manometer on the chlorination apparatus indicated that the chlorine was being applied at the rate of 8.1 pounds per day, which taken in connection with the fact that the Worthington pump described below was operating at 36 r. p. m. made the rate of application 0.32 p. p. m. Scales are provided under the cylinder for checking the rate of application of the chlorine, and a duplicate chlorinating apparatus is kept at the station for use in case of emergency.

Daily routine analyses of the water are made by the attendant at the filtration plant for the control of its operation. These analyses consist of examinations for alkalinity and bacterial counts of the raw and filtered water and presumptive test for B. coli. Weekly check analyses are made at the laboratory of Hill and Ferguson in New York city.

The condition of the Pocantico reservoir and the three smaller reservoirs was fairly satisfactory at the time of the inspection. They were all free from algae growths and the water appeared to be clear and colorless. The condition of the sides of the high pressure reservoir has been considerably improved since the time of the last inspection by the removal of the brush which formerly grew in the riprap at and above the water line. It is understood that the Pocantico reservoir has been treated with copper sulphate every two weeks during the present season and that the treatment has been successful in preventing the growth of algae. The copper sulphate used has been applied in a powdered form.

At the time of the inspection the water in the different villages appeared to be of satisfactory sanitary and physical quality, no tastes or odors being apparent at any point. In the northern part of Scarsdale, however, at the end of the lines of the company, it is understood that some difficulty has been experienced from tastes, odors, and color. An examination of the water, however, at this point at the time of the inspection did not reveal such a condition. The engineer from this Department visited the house of one of the complainants in this section and was told that the water had been unsatisfactory, but at the time of the inspection and for two or three days prior no difficulty had been experienced. Since this district is at the end of the lines of the company at a point where there is no circulation, it is probable that the color, tastes, and odors complained of are due to the fact that the water lies in the pipes for a considerable time and takes up iron from them. The analyses of the samples of the water bear out this conclusion. The iron content of the water at the plant is comparatively low, while that of the water taken from the hose tap in a Mr. Kuss' house, where it had probably stood in the pipe for some time, was high. The superintendent of the water company stated that he had been flushing these pipes at very frequent intervals in order to improve the condition, and the street commissioner of Scarsdale confirmed this statement. It would appear that the flushing of these pipes should be done at frequent intervals in order to keep the water in this section in a satisfactory condition.

The health officers of the four villages supplied, when interviewed by the representative of this Department, stated that the quality of the water had been fairly satisfactory for the past year and that they had received very few complaints regarding it.

As a result of the investigation it was recommended that the Consolidated Water Company of Suburban New York continue to maintain careful supervision over the condition of the watershed from which the supply is derived and over the operation of the plant, and that they frequently flush those mains where there is little circulation in order to prevent the water from lying in the pipes for any length of time and thus deteriorating in quality.

NORTH TONAWANDA

The method of chlorinating the water supply of North Tonawanda was inspected by representatives of the Engineering Division on January 21 and October 19, 1920. These inspections were made primarily because of outbreaks of typhoid in the city during previous years, due to the failure of the chlorinating apparatus to operate. At the time of these inspections it was found that chlorine was being satisfactorily applied to the water.

OCEAN BEACH

An inspection of the public water supply of the village of Ocean Beach, Suffolk county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on May 26, 1920.

Ocean Beach is located on Fire Island, about 6 miles southwest of Bay Shore, and is a summer resort having a summer population of about 3,500. The entire population is served with water from the public supply, which is owned and operated by the Ocean Beach Water Company.

The water supply is obtained from shallow wells located about 2,000 feet south of the boat landing, and about 300 feet north of the Atlantic ocean. From the wells the water is delivered by pumping through a distribution system consisting of about 3 miles of castiron pipe, the surplus going to a small tank having a capacity of about 25,000 gallons. The wells consist of five 4-inch and three 2-inch driven wells, 20 feet deep, placed 40 feet apart, north of the pumping station. There are apparently no sources of pollution within the vicinity of the wells. The houses are connected to a sewerage system and the sewage disposed of through a sewage disposal plant located east of the boat landing. The water company owns a plot of ground about 50 feet by 80 feet in size, which has not been fenced to prevent trespassing.

As a result of the inspection it was concluded that the public water supply was of a reasonably satisfactory sanitary quality, but that certain possibilities for local contamination of the supply existed; and it was therefore recommended that the authorities in charge of the supply exercise careful supervision over the area in the vicinity of the wells, and that the land owned by them around the wells be fenced to prevent trespassing.

OSSINING (Sing Sing Prison)

Amended plans for a water supply system at Sing Sing prison, Ossining, N. Y., were submitted to this Department for approval by the State Architect on January 26, 1920. The plans comprise State Architect's drawings Nos. 2138, 2139, 2140, 2159, 2105, and 2107, approved by this Department on July 7, 1918; and drawing No. 2106, approved by this Department on May 25, 1918. The amendments consisted of minor changes in the location of the lines, and the incorporation of the line to the mess hall, formerly shown as a future extension, the installation of a cross-connection between the low pressure systems, and the installation of chlorination apparatus for treating that part of the supply taken from the Croton Aqueduct. After careful consideration by the Engineering Division, plans were approved on February 11, 1920.

OWEGO

A reinspection of the public water supply of the village of Owego, Tioga county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on March 25, 1920, previous inspections of the supply having been made by this Division in 1912 and 1915.

Owego is a village of about 5,000 inhabitants, located in the south-central part of Tioga county, 20 miles west of the city of Binghamton. About 80 per cent of the total population are served by the public water supply. The waterworks are owned and operated by the Owego Water Works Company.

The water supply is derived from two sources: Barnes creek, an upland stream northeast of the village, and two shallow dug wells in lowland in the northwestern part of the village. The creek supply, after treatment by coagulation and mechanical filtration, is distributed by gravity to the village. The well supply is pumped directly into the system against a head maintained by the clear water reservoir at the filter plant. The average daily water consumption is said to be approximately 700,000 gallons, or about 175 gallons per capita per day.

As a result of the reinspection it was concluded that the authorities in charge of the water supply have not carried out all of the recommendations of our last report, that the filtration plant as operated could not be depended upon to produce a satisfactory water at all times, that there were certain opportunities for serious contamination of the well water supply, and that although the apparatus for sterilization of the water by liquid chlorine had been ordered, it was not in place at the time of the inspection. It was therefore recommended that the Water Works Company carry out, without delay, the recommendations of our previous reports regarding the improvement of the present supply or the securing of a new one, and that liquid chlorine be applied to the water at all times in such quantities as properly to sterilize it.

OXFORD

A reinspection of the public water supply of the village of Oxford, Chenango county, N. Y., was made by Mr. N. H. Baier, sanitary inspector in this Department, on November 22, 1920, previous inspections of the supply having been made by this Division in the years 1916 and 1917.

Oxford is located on the Chenango river in the north-central part of the town of Oxford, about 33 miles north of Binghamton. The population is approximately 1,590, of which about 75 per cent is served by the public water supply. The waterworks are owned by the village and operated under the control of a board of water commissioners.

The water of the main supply is derived from springs developed by the construction of three basins located on a sidehill about 4 miles north of the village, and is delivered to the consumers by gravity through a distribution system consisting of about 12 miles of castiron pipe. A reservoir of about 250,000 gallons capacity, located approximately one-fourth of a mile north of the village, takes the surplus water and acts as an equalizing reservoir.

The apparent watershed of the spring is approximately 0.2 of a square mile in area and is for the most part used for pasture or cultivated. There are no houses on the shed. The area surrounding the springs is fenced. An inspection of the springs and their surroundings is said to be made by the superintendent of the waterworks every few weeks.

In order to augment the spring supply, a 6-inch well about 300 feet deep was drilled a few years ago, but has since been abandoned because its capacity was only about 15 gallons per minute. The well of the Borden's Condensed Milk Company, about 65 feet deep, is however, being regularly used as an auxiliary source of water supply. This well is unsatisfactorily located in the fairly well built-up portion of the village, where it is possible that pollution may at times reach the water. The village is also contemplating using the water from the well of the Rural Products Company, which is 151½ feet deep, the first 100 feet passing through clay and broken rock, and the remaining 51½ feet through solid bluestone rock. The casing is said to extend to the bluestone.

The analyses of samples of water taken August 2, 1920, show the water to contain active contamination. This may, however, have been due to the fact that the well had recently been drilled and not used to any extent.

A later sample indicated that the water was free from active contamination at the time it was taken.

As a result of the inspection it was concluded that the regular or spring supply of the village was of satisfactory sanitary quality at the time of the inspection, but that it is necessary at times to use water from auxiliary sources which are not entirely satisfactory. It was therefore recommended that the present careful supervision of the regular or spring supply by the village be continued, and that steps be taken to secure an auxiliary supply of satisfactory sanitary quality.

OXFORD (Women's Relief Corps Home)

An inspection of the water supply of the New York State Women's Relief Corps Home, at Oxford, Chenango county, N. Y., with special reference to the devolpment of a new source of supply, was made by Mr. W. C. Emigh, assistant engineer in this Department, on July 19, 1920.

As a result of this investigation it was concluded that the development of an additional water supply by using the suction well near the power plant of the institution was inadvisable on account of the potential sources of contamination in the vicinity, and it was recommended that as far as possible the present sources of water supply be protected from contamination, as recommended in the report on the investigation of March, 1920; that the water from the suction well near the power plant be not pumped into the institution mains for drinking or culinary purposes; that a test well be sunk on the hillside above the power house; and that a series of analyses be made of the water from this test well to determine its suitability as a water supply for drinking and culinary purposes.

OYSTER BAY

A reinspection of the public water supply of the unincorporated village of Oyster Bay, Nassau county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on June 15, 1920, previous inspections of the supply having been made by this Division in 1915 and 1918.

Oyster Bay is located in the northeast corner of the town of Oyster Bay, about 35 miles east of New York city. The population is estimated at about 5,000, of whom only about 25 per cent are served by water from the public supply. The waterworks are owned and operated by the Nassau Water Company.

The supply is derived from three 8-inch driven wells located in the southwestern part of the village. Two of the wells, one 398 feet and the other 500 feet deep, are directly connected to the pump suction. The other well. 497 feet deep, is a flowing well, discharging into a small concrete receiving chamber about 15 by 25 feet in plan and 10 feet deep, from which the water is taken by pumps. The wells are rather unfavorably located in a depression which apparently receives the drainage from the toilets of the surrounding territory. There are some 18 or 20 houses east of the plant within a radius of 500 feet, all located on higher ground than that on which the wells are drilled. The nearest houses are about 150 feet east of the wells. None of the houses have sewer connections. Some are provided with earth vault privies and some with leaching cesspools. The engineer's residence is located in the second story of the pumping station, and the sewage is discharged into the cesspool some 7 feet west of the pumping station. About 100 feet west of the pumping station is the Mill Pond creek, and while it is said that the water never rises high enough to reach the ground around the wells, it seems probable that after heavy storms this stream may be a possible source of pollution.

A Wallace & Tiernan manual control solution feed chlorinator was installed in 1918. At the time of the inspection, however, the apparatus was not operating. due to the fact that it was impossible properly to regulate the amount of chlorine flowing to the solution chamber.

Samples of the water were taken at the time of the inspection and sent to the Division of Laboratories and Research for examination. The results of the bacterial examination of these samples show very high counts, and the presence of bacteria of the colon group in nearly all of the inoculations tested, including one of the 1/10 c.c. inoculations, indicating that the water contained active contamination at the time the samples were taken.

As a result of the inspection it was concluded that the water company had not carried out the recommendations of this Department, and that the water supply of the village was receiving pollution and was not of satisfactory sanitary quality at the time of the inspection. It was therefore recommended that the chlorination apparatus be immediately repaired, and that chlorine be applied to the water continuously in proper proportions at all times; that duplicate apparatus be secured and kept at the pumping station in order to insure continuous operation; that as far as possible all sources of pollution in the vicinity of the wells be removed; and that the well casings and suction lines be examined for leaks, and all leaks discovered be immediately and effectively stopped.

PATCHOGUE

A reinspection of the water supply furnished by the Great South Bay Water Company to the village of Patchogue, and the unincorporated villages of Bay Shore, Islip, East Islip, Great River, Sayville, West Sayville, Bayport, and Blue Point, Suffolk county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on May 24 and 27, 1920, a previous inspection of this supply having been made by this Division in 1918.

The villages supplied are located along the south shore of Long Island in the vicinity of Patchogue, and have a total population of about 25,000, approximately 75 per cent of which is served with water from the public supply.

The water is derived from driven wells, part of which are located in the northwestern section of Bay Shore about one-half mile northwest of the railroad station, and part in the northwestern section of Patchogue on the north side of the Long Island railroad about one-fourth of a mile west of the Patchogue river. The water is delivered by pumping into a distribution system of about 100 miles of castiron pipe, to which are connected 4 steel standpipes which act as equalizing reservoirs. The total water consumption in winter is approximately 1,500,000 gallons and in summer about 2,700,000 gallons, the average consumption being equivalent to about 115 gallons per capita per day.

The wells at Bay Shore consist of twelve 10-inch, six 8-inch, and eight 5-inch driven wells, all of which are about 60 feet deep. The eight 5-inch wells are to be abandoned, and four 8-inch wells, which are now being driven, connected to the system. Concrete pits, 4 feet square and 5 feet deep, similar to those now surrounding the 10-inch wells, will be constructed about the new wells. At Patchogue the driven wells consist of fifteen 10-inch wells, about 50 feet deep, of which ten wells are now in use. The wells are surrounded by wooden boxes and located in a plot of ground about 300 feet by 800 feet in size, which is situated in the built-up portion of the village.

As a result of the reinspection of the public water supply of the Great South Bay Water Company, it was concluded that the company has only partially carried out the previous recommendations of this Department, and that while the analyses of samples of water taken at the time of the inspection did not show active contamination, certain potential sources of contamination existed and that the water might become actively contaminated at any time. It was therefore recommended that the water company maintain careful supervision over the area in the vicinity of the wells to prevent incidental pollution of the ground; that watertight containers be provided for all privies within a radius of 500 feet of the wells at both plants; that all cesspools within that distance be made watertight, and that the containers and cesspools be properly cleaned at frequent intervals and the contents disposed

of in some remote place. It was also recommended that the water company, in cooperation with the village authorities, consider the installation of a properly designed sewer system for the area in the vicinity of the wells, and the subsequent elimination of all privies and cesspools in the vicinity of this area.

PEEKSKILL

A reinspection of the water supply of the village of Peekskill was made on August 4, 1920, by Mr. A. I. Howd, assistant engineer. A previous inspection of this supply was made by this Department in 1917.

Peekskill is an incorporated village having a population of 16,200, located about 40 miles north of New York city. Of the total population, about 90 per cent are served with water from the public water supply. The waterworks are owned and operated by the municipality under the direction of a board of water commissioners.

The water supply is derived from Peekskill Hollow creek, the intake being located about 2 miles northeast of the village. The water is pumped from Peekskill Hollow creek through a 12-inch and 20-inch force main to a 30-million gallon storage and sedimentation basin on a hill about 1 mile south of the village. The water flows from the basin through a gate house and screen chamber provided with a ¼-inch mesh screen, and through a 16-inch pipe to an aerator in a circular concrete basin 30 feet in diameter and 10 feet deep below the water level. The aerator consists of a 16-inch riser capped with a plate perforated with 1-inch holes. The water flows from the aerator to four units of covered slow sand filters, each unit having dimensions of 65 feet by 143 feet, or a total area of 0.850 acres. The filtering medium consists of successive layers of 18 inches of coarse stone, 12 inches of 1½-inch stone, 10 inches of gravel, and 36 inches of sand. The filters are provided with loss of head gauges and the rate of filtration is controlled by hand operated valves.

The rate of filtration with the average consumption is almost 4,000,000 gallons per acre per day, but at times of maximum draft, particularly when one bed is cut out for cleaning, the rate considerably exceeds this figure.

The water flows from the filters into a covered clear water well which had dimensions of 43 feet by 160 feet by 10 feet deep, and a capacity therefore of 516,000 gallons. The water flows by gravity from the clear water well through a 12-inch and a 16-inch main to the village.

As a result of the above inspection it was concluded that Peekskill Hollow creek, the source of water supply of Peekskill, is subject to direct and indirect pollution from the population on the watershed; that certain violations of the rules and regulations enacted by this Department exist; and that the filter plant was being carefully operated at the time of the inspection. It was therefore recommended that the authorities in charge of the water supply strictly enforce the rules and regulations enacted by this Department for the protection of their source of water supply from contamination; that they continue their careful supervision of the operation of the filtration plant, and that they install apparatus for the sterilization of the supply with liquid chlorine at times when the filters are operated at very high rates.

The water of this supply is used by the New York Central Railroad for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on November 12, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were satisfactory and that the results of the inspection and the analyses of the samples, together with the results of previous inspections and analyses, indicate that the water was of satisfactory quality for human consumption at the time of the inspection. A copy of the report accompanied this data. Based on this information the United States Public Health Service on November 17, 1920, issued a certificate permitting the use of the water for drinking and culinary purposes in interstate traffic.

PETERSBURG

A reinspection of the water supply of the village of Petersburg was made on October 11, 1920, by Mr. W. J. Erickson, sanitary inspector. A previous inspection of this supply was made by this Department in 1917, the report upon which is published in the Annual Report of the Department for that year.

Petersburg is an unincorporated village of 200 inhabitants located in the eastern part of Rensselaer county about 18 miles east of Troy. The waterworks are under the control of the Petersburg water district. The village is not provided with public sewers.

The supply is ordinarily derived from a small stream tributary to the Little Hoosick river known as Fly creek, and a small tributary thereto. The intakes are located about half a mile west of the village. An auxiliary supply is derived from a dug well on the westerly bank of the river in the northeastern part of the village.

An earthen dam with a concrete core wall has been constructed across Fly creek forming a storage reservoir. This reservoir is about 150 feet wide and 200 feet long and on an average 6 feet deep, with a storage capacity of about 1,300,000 gallons. As the dam is constructed on sand and gravel a considerable amount of water leaks through the bottom. The tributary or southern watershed is developed by the construction of a small intake basin on the tributary below the storage reservoir from which the supply goes directly to the mains as there is no storage. When this supply is used the pipe leading from the main reservoir is closed as the intake on this line is at a lower elevation. The southerly intake was in use at the time of the inspection.

The well is located about 22 feet from the Little Hoosick river. It is about 4½ feet square and 9 feet deep, and covered with timber and about 2 feet of earth. The ground water undoubtedly receives some pollution from the various houses and privies located above the well, and from infiltration from the Little Hoosick river which receives pollution, largely indirect, from farm houses and small hamlets on its watershed. As to whether there would be sufficient purification of the water at times when there is a heavy draft on the well and consequently a more rapid infiltration is indeterminable with the data on hand. There are about 5 houses with a population of about 25 within 500 feet, and 12 houses with a population of about 50 within 1,000 feet of the well.

The analysis of samples at the creek supply shows a water that is somewhat colored, practically clear and soft. The amount of organic matter is moderate as shown by the ammonia compounds. The northerly branch shows a freedom from active contamination while the southerly branch shows high counts and organisms of the B. coli type in all three 1 c. c. inoculations.

The analysis of the well supply shows a water that is clear, slightly turbid, and moderately hard. The amount of organic contamination is considerable and is apparently of animal origin as indicated by high figures for the ammonia compounds, particularly that for the free ammonia and nitrites. The figure for chlorine is higher than that for ground waters of this vicinity. The total bacterial count is low and organisms of the B. coli type are absent.

As a result of the inspection it was recommended that no cattle be allowed to pasture within 50 feet of the reservoir; that the south branch of Fly creek be abandoned as a source of supply, unless suitable and adequate methods be provided for its purification, and that the well be abandoned; and if necessary, an additional supply of satisfactory sanitary quality be obtained by the development of a new source free from pollution, or a well or wells at least 50 feet from the river and remote from other possible sources of pollution.

PHOENICIA

A reinspection of the water supply of the village of Phoenicia was made on October 25, 1920, by Mr. W. J. Erickson, sanitary inspector. A previous inspection of this supply was made by this Department in 1916, the report upon which is published in the Annual Report of the Department for that year.

Phoenicia is an unincorporated village located in the northern part of Ulster county, on the Ulster and Delaware railroad, 23 miles northwest of Kingston. The village has a resident population of about 450 which is increased to about 1,100 in the summer months. About 80 per cent of the population is served with water from the public supply, which is owned and operated by the Phoenicia Water Works Company. There is no public sewerage system, the houses being served by privies and cesspools.

The water supply is derived from springs located about a mile east of the village. From the springs the supply is conducted to a 150,000-gallon storage reservoir from which it flows by gravity through about 2½ miles of mains to the consumers. During the summer the regular supply is supplemented from Muddy creek, the intake being located about a mile and a-half west of the village.

The springs, 6 in number, are located in a ravine on the slopes of Trumer mountain. There is some possibility of surface wash entering them particularly one which is fed by a spring brook. As the watershed is unpopulated, heavily wooded, practically inaccessible, there is practically no possibility of contamination except from animals crossing the watershed.

The watershed tributary to Muddy brook above the intake is about a mile and a-half in area. This area is located on the side of Garfield mountain and is rather steep and almost entirely wooded. There is but one house on the watershed, which is occupied only during the summer months. The privy is located about 200 feet from the stream and is provided with a concrete vault. It seems probable that if this place is kept in a proper sanitary condition there is little danger of serious pollution from this source. There is, however, as in all surface supplies, the ever present possibilty of contamination from animals and from visitors on the watershed. This brook cannot be considered an entirely satisfactory source of supply unless very carefully inspected at frequent intervals and protected from possible pollution.

As a result of this inspection it was recommended that frequent inspections of the watersheds of the supply be made in order to detect and abate any source of pollution found thereon, and that should any difficulty be experienced in carrying out this recommendation, application be made to this Department for the enactment of rules and regulations for the sanitary protection of the supply.

The water of this supply is used by the Ulster and Delaware Railroad for drinking and culinary purposes. Data regarding this supply were furnished to the United States Public Health Service on November 23, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were satisfactory, and that the conditions surrounding the auxiliary supply were not entirely satisfactory. The results of the inspection and analyses of the samples of water, together with results of previous inspections and analyses, indicate that the water of the main supply was of satisfactory quality for human consumption, but that the water of the auxiliary supply, used in summer only, cannot be considered of an entirely satisfactory quality unless very carefully inspected at frequent intervals and protected from possible pollution. A copy of the report accompanied this data. Based on this information the United States Public Health Service on November 30, 1920, issued a certificate permitting the use of the water from the main supply for drinking and culinary purposes in interstate traffic, and also a certificate prohibiting the use of the auxiliary supply in cars engaged in interstate traffic.

PHOENIX

A reinspection of the water supply of the village of Phoenix was made on July 7, 1920, by Mr. Earl Devendorf, assistant engineer. A previous investigation of the supply was made by this Department in 1914.

Phoenix is an incorporated village of about 2,000 inhabitants located in the southwestern part of Oswego county, about 20 miles northwest of the city of Syracuse. The public water supply is owned and operated by the village under a Board of Water Commissioners.

The water supply is obtained from the Oswego river, from which the water is pumped direct to the distribution system, the excess over consumption going to a standpipe located in the village. The watershed of the Oswego river above Phoenix covers many square miles and receives the indirect sewage from the inhabitants on the watershed as well as the direct sewage of the cities and villages, the larger of which are the city of Syracuse and the village of Baldwinsville.

The fire supplies of the Oswego River Paper Mill, the Three River Paper Mill, and the Phoenix Toilet Paper Company are pumped from the river and are cross-connected to the village supply. While the cross-connection makes little difference at the present time, as the public supply is obtained without purification from the river, when the supply is treated or a new safe supply obtained the connection should be eliminated or equipped with a double check and gate valve.

As a result of the above investigation it was concluded that, as pointed out in the previous report, the Oswego river is grossly polluted and its water unfit for human consumption without adequate purification; and it was therefore recommended that the village authorities install a suitable treatment plant, or obtain a new water supply adequate in amount and of a satisfactory sanitary quality, and that pending the installation of a new supply of safe sanitary quality the village authorities warn the public not to use water from the public supply for drinking or culinary purposes.

PINE PLAINS

A reinspection of the water supply of the village of Pine Plains was made by Mr. W. J. Erickson, engineering assistant, on May 21, 1920. A previous inspection of this supply was made in 1915.

Pine Plains is an unincorporated village of about 850 inhabitants located in the town of Pine Plains, in the northern part of Dutchess county, near the headwaters of Wappingers creek. Practically all of the inhabitants use the public water supply which is owned by Pine Plains Water Company.

The supply is derived from springs located on the slope of Stissing mountain, about 2 miles west of the village, and from a well located near the foot of a hill in the southeastern part of the village below the reservoirs, the latter source being used only in times of drought when the springs fail. The supply from the springs flows by gravity to the distribution system and the reservoirs.

The spring supply is derived from two springs from which the water flows to a collecting basin. The springs and collecting basin are covered with wooden roofs and surrounded by a masonry wall. The roof of the collecting basin was in bad repair at the time of the inspection. The springs are located in shale and there is practically no top soil. The area tributary to the springs is approximately half a square mile in area. There are no houses on this area and probably the only pollution would be from animals in the wood and from passing hunters. The yield in time of drought is materially decreased and it becomes necessary to supplement by pumping from the well.

The well is located in the southeastern part of the village near the foot of the hill on which the reservoirs are located. This well which is 6 inches in diameter and 300 feet deep was drilled through solid bluestone rock for

the entire distance, except for about 2 feet of top soil. It is cased for the entire distance and a concrete curb prevents the water from leaking back into it. The well and pumping equipment is housed in the cellar of a frame building the upper section of which is used for storage.

The company owns about one-quarter of an acre immediately above the well and there are no houses located there. The nearest house is about 75 feet from the well and at a higher elevation than the well. The drainage, however, is not in the direction of the well. The privy of this house is about 200 feet from the well. There are two other houses slightly lower than the well, about 150 feet from it. The privies of these houses are 150 feet and 300 feet from the well respectively. The well had not been in use for some time previous to the inspection.

As a result of the inspection it was concluded that the water derived from the springs was of a satisfactory sanitary and physical quality at the time of the inspection, but that the new well supply was liable to contamination from the neighboring houses; and the interior of the pump through leaks in the casing and cracks and fissures in the rock; and that the interior of the well house was not kept in a neat and sanitary condition.

It was therefore recommended that the well house and surroundings be cleaned up, and strict supervision be maintained over the building and the land in the vicinity to minimize the chances of pollution of the well supply.

PLATTSBURG

An investigation of the public water supply of the city of Plattsburg, with special reference to the odors in the water and the method of chlorinating the water, was made by Mr. Henry Ryon, assistant engineer in this Department, September 24, 1920, and November 17, 1920.

The unsatisfactory physical quality of the water seemed for the most part to have been due to growths of algae, protozoa, and other organisms in the reservoirs. The removal of the plants of the higher organisms, and the dredging and draining off of some of the shallow parts of the reservoirs would undoubtedly be a desirable improvement which would prevent to some extent the growths of these organisms but would undoubtedly be very expensive. It seems desirable, however, that some attention should be given to this matter and that the aquatic plants be removed as far as possible, and those parts of the reservoir where water lies stagnant in shallow pools eliminated. The growths of these organisms can be prevented by the application of copper sulphate in proper proportions, and since this treatment is comparatively inexpensive, it would seem advisable that it should be carried out each year before the appearance of the organisms and continued until the danger of their appearance is past.

The chlorination of the water supply as now carried on, while it undoubtedly greatly reduces the danger of waterborne disease in the city, cannot be considered as entirely satisfactory. The chlorination plants are located at remote places where it is difficult to give them proper attention, particularly in winter, with the consequent danger of interruption of the service, and there is no means of measuring the flow of water and regulating the application of chlorine in proportion to the flow. It has been recommended that a single chlorination plant and a Venturi meter be installed at the receiving basins. By this change the chlorination plant will be placed where it will be easily taken care of, the flow of water measured, and the application of chlorine regulated accordingly.

Samples of water were taken at the time of the inspection and sent to the Division of Laboratories and Research for examination. The result of the examination of these samples indicated that the water of both Mead and West brooks contained active contamination at the time these samples were taken, and that the chlorinated water as taken from the tap in the city also contained active contamination.

As a result of the investigation it was recommended that a chlorinating plant for sterilizing all the water taken from both West and Mead brooks be installed and put in operation without delay; that a suitable apparatus for measuring the flow of water be installed in connection with the chlorination apparatus; that chlorine be applied to the water continuously at all times in such proportions as effectively to sterilize it. It was also recommended that the reservoirs be as far as possible cleared of aquatic growths, and that they be treated with copper sulphate each year to prevent the growth of algae.

The water of this supply is used by the Delaware and Hudson Railroad for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on October 18, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were not entirely satisfactory, and that the results of the inspection and analyses of the samples, together with the results of previous inspections and analyses, indicate that the water cannot be considered to be of satisfactory quality for human consumption until the chlorinating plant is installed, as recommended. Based on this information the United States Public Health Service on November 11, 1920, issued a certificate stating that the use of the water for drinking and culinary purposes in interstate traffic was not permitted.

POINT O'WOODS

An inspection of the public water supply of the unincorporated village of Point O'Woods, Suffolk county, was made by Mr. Alfred Mullikin, assistant engineer in this Department, on May 25, 1920.

Point O'Woods is located on Fire Island, in the southern part of the town of Brookhaven, about 60 miles from New York city. The settlement is made up almost entirely of summer visitors. The waterworks are owned and operated by the Point O'Woods Association.

The water supply is derived from 10 driven wells located in the southern part of the settlement about 400 feet north of the Atlantic Ocean. These wells are driven to a depth of about 20 feet through a stratum of fine sand, increasing in size to a coarse gravel. The area around them, owned by the Association, is not fenced to prevent trepassing. The density of the population within a distance of about 500 feet of the wells is approximately 180 per square mile. The settlement is provided with several subsurface irrigation sewage disposal plants located about 1,000 feet north of the wells. The water supplies seem to be fairly well protected from contamination, with the exception of the fact that the soil in the vicinity might be polluted by trespassers and that leakage from nearby sewers might possibly reach this supply.

As a result of the inspection it was recommended that the Association authorities relay such tile sewers as pass within 500 feet of the wells with castiron pipe with lead joints, and that a reasonable area in the vicinity of the wells be enclosed by a fence to prevent trespassing.

PORT HENRY

A reinspection of the water supply of Port Henry was made by Mr. W. J. Erickson, engineering assistant in this Department, on September 4, 1919, previous inspections of the supply having been made by this Division in the years of 1915 and 1918.

Port Henry is an unincorporated village in Essex county, located on the west shore of Lake Champlain, about 117 miles north of Albany. It has a population of about 2,600 people, most of whom are served by the public

supplies. There are two supplies, one owned and operated by the village; the other known as the Witherbee supply, owned and operated by the estate of J. G. Witherbee. This latter supply is used by only about 6 per cent of the population.

The municipal supply is derived from Bartlett brook and a spring located about 3 miles north of the village. The water from Bartlett brook is delivered through a 3-inch pipe from a diverting dam into a small collecting basin. The water from the spring is carried through a 6-inch pipe from a small collecting basin to a 6-inch pipe from the Bartlett brook collecting basin. The mixed water is conducted to a settling basin from which it flows to the filters, which have a total area of about 0.09 of an acre and operate at the rate of from 17,500,000 to 25,000,000 gallons per day.

As a result of the inspection it was concluded that the majority of the previous recommendations of this Department have been carried out, and that if properly operated the filters should deliver a water of satisfactory physical and sanitary quality. It was accordingly recommended that a very rigid supervision be maintained over the filter plant and the watershed.

The privately owned supply is derived from 16 springs on the property of the J. G. Witherbee estate. From these springs the water is conducted to two receiving wells from which it flows to a storage reservior one mile nearer the village. From this reservoir it is distributed to the consumers by gravity.

As a result of the investigation it was found that the spring houses were in need of repair, and that the springs were not properly protected from surface wash and trespassers. Since this condition had been pointed out in the previous reports of this Department, it was recommended that those in charge of the supply carry out the previous recommendations of this Department at the earliest possible time.

PORT JEFFERSON

A reinspection of the water supply of the unincorporated village of Port Jefferson was made on June 23, 1920, by Mr. Alfred Mullikin, assistant engineer, a previous inspection of this supply having been made by this Division in 1915.

Port Jefferson is located in the northern part of the town of Brookhaven, about 59 miles from New York city. The present population is estimated at 3,000, of which about 80 per cent are served with the water from the public supply. The waterworks are owned and operated by the Port Jefferson Water Company.

The supply is derived from 4 driven wells located about a mile northwest of the railroad station, in a low part of the village on the bank of the Port Jefferson Harbor. There is one new well which has just been sunk but which has not been connected up to the supply, making in all 5 wells.. The water is delivered by pumping through a distribution system consisting of some 8 miles of castiron pipe, the surplus going to a concrete reservoir and a steel standpipe.

The driven wells are located along the east side of the brick building and about 10 feet away from it. Two 6-inch wells 50 feet deep were not being drawn upon at the time of the inspection. One 6-inch well 48 feet deep, and one 6-inch well 55 feet deep, were supplying the water to the village at the time. A new 6-inch flowing well has been driven this year to a depth of 95 feet which it is estimated will produce over 500 gallons per day. This well was not connected to the supply at the time of the inspection. The wells pass through 5 feet of loam, 51 feet of sand and gravel, and 3 feet of hardpan into a water bearing gravel.

A privy not provided with a vault and in an insanitary condition exists about 25 feet east of the wells, and another privy in similar condition exists about 150 feet south of the wells. Some 200 feet east of the wells a small stream passes through the village and discharges into the harbor. This

stream, which formerly received considerable sewage from a large portion of the village, has been practically freed from this pollution since the beginning of 1920, when the sewage disposal plant was completed and put in operation.

As a result of the reinspection of the supply, it was concluded that the recommendations of our previous report have in part been carried out; that the water supply from the old wells was of a satisfactory sanitary quality at the time of the inspection, but that there remain certain possibilities for serious and dangerous contamination of the public supply in view of the fact that numerous privies of unsatisfactory construction exist within a short distance of the wells.

It was accordingly recommended that wherever possible the privies and cesspools within 500 feet of the wells be abandoned, the cesspools and vaults cleaned, disinfected, and refilled with fresh earth, and the houses served provided with inside fixtures connected to the sewerage system, and that when it is impossible to connect a house or building to the sewer system and abandon the privy or cesspool serving such house or building, the privy be provided with watertight removable container, and the cesspool made watertight, and that such privies or cesspools be cleaned at frequent intervals, the contents disposed of in a satisfactory manner in some remote place and maintained in proper sanitary condition. It was also recommended that a careful sanitary patrol be maintained over the area within the vicinity of the wells at all times.

PORT JERVIS

A reinspection of the public water supply of the city of Port Jervis was made by Mr. W. J. Erickson on May 14, 1920, previous inspections of the supply having been made in 1908, 1909, and 1915.

Port Jervis is a city of about 10,300 inhabitants located on the Delaware river, in the western part of Orange county. About 90 per cent of the total population is furnished with water from the public supply, which is owned and operated by the Port Jervis Water Company.

The supply is derived from several small streams north of the city and collected in three impounding reservoirs, from which it is delivered to the consumers by gravity. An auxiliary supply is obtained by pumping from the Neversink river. The water consumption is about 300,000 gallons per day.

The watershed of the main supply covers an area of about 5½ square miles, most of which is hilly and wooded. Approximately 1,800 acres of this area is owned by the Water company. Except the two dwellings of the caretakers, there are no houses on the land draining to the reservoirs. The only possible source of pollution noticed at the time of the inspection was a road skirting reservoir No. 1.

The watershed of the Neversink river, from which the auxiliary supply is obtained, has an area of about 350 square miles, and receives considerable pollution from the villages and hamlets located along it. The water from this source whenever used is sterilized with liquid chlorine.

As a result of the inspection it was concluded that the water supply derived from the upland stream was of a satisfactory sanitary and physical quality, but that the auxiliary supply from Neversink river was not suitable for human consumption without treatment.

It was therefore recommended that the Water company continue their careful oversight of the water supply, and that whenever the water from Neversink river is used it be effectively sterilized with liquid chlorine.

The water of this supply is used by the Erie and the New York Ontario and Western Railroads for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on October 23, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the main supply were

satisfactory, and that the results of the inspection and analyses of the samples, together with the results of previous inspections and analyses, indicate that the water of the main supply was of satisfactory quality for human consumption. The conditions surrounding the auxilary supply were not satisfactory, and the water derived therefrom cannot be considered satisfactory without efficient chlorination. A copy of the report accompanied this data. Based on this information the United States Public Health Service on November 24, 1920, issued a certificate permitting the use of this supply for drinking and culinary purposes in interestate traffic.

PORT WASHINGTON

A reinspection of the public water supply of the unincorporated village of Port Washington, Nassau county, was made by Mr. Alfred Mullikin, assistant engineer in this Department, on June 11, 1920, a previous inspection having been made by this Division in 1916.

Port Washington is located in the northern part of the town of North Hempstead, abount 20 miles from Mineola. The total population in winter is about 5,000, but increases to about 12,000 in the summer. Of the total population, 80 per cent are served with water from the public supply, which is owned by the Nassau County Water Company.

The water supply is derived from 3 8-inch driven wells 75 feet deep, 3 8-inch driven wells 190 feet deep, and 1 12-inch driven well 55 feet deep. The wells are located in a low piece of wooded marsh land covering about 4 acres in the north central part of the village, approximately one-half mile northwest of the Long Island Railroad depot. The wells are subject to possible indirect pollution by surface wash from the road, and some 8 or 10 houses at a higher elevation than the wells within a distance of about 500 feet. Most of these houses are provided with earth vault privies, although some are equipped with patent metal containers, which it is said are regularly disinfected.

As a result of the reinspection it was concluded that the authorities in charge of the water supply have in part carried out the previous recommendations of this Department but that there remain certain opportunities for possible contamination of the supply; that the bacterial analyses show active contamination of the water; and that the water cannot be regarded as one of entirely satisfactory sanitary quality.

It was therefore recommended that all the houses in the vicinity of the wells be connected with the sewerage system or provided with privies having watertight containers; that the Water company take all possible precaution to prevent pollution of the soil in the vicinity of the wells; and that if the elimination of all possible sources of pollution in the vicinity fails to prevent contamination of the water, it be sterilized by the continuous application of liquid chlorine, or a new source of supply be developed.

POUGHKEEPSIE

A reinspection of the public water supply of the city of Poughkeepsie was made by Mr. A. I. Howd, assistant engineer in this Department, on October 28, 1920, previous inspections of the supply having been made by this Division in 1907, 1915, and 1916.

The city of Poughkeepsie has a population of about 35,000, and is located in the west-central part of Dutchess county, on the east bank of the Hudson river. The waterworks are owned and operated by the city under the direction of a board of public works.

The water supply is obtained from the Hudson river, the intake being located about a mile north of the center of the city. The water is pumped from the river through a filtration plant from which it flows, after treatment,

back to the pumping station. It is then pumped to a 13,000,000-gallon open reservoir on College Hill Park, from which it is delivered by gravity to the city. The daily consumption averages about 2,900,000 gallons, or 87 gallons per capita.

The raw water flows from the Hudson river through a 24-inch castiron intake pipe to two suction wells, where coagulant is applied to it in the form of powdered alum by a dry-feed machine at rates varying from 8.9 to 2.5 grains per gallon. From the suction well the water is lifted to the sedimentation basin, liquid chlorine being applied to it at the rate of about 0.48 parts per million just before it enters the basin. This basin is baffled and provides a detention period of approximately 18 hours. From the sedimentation basin the water flows to four preliminary rapid sand filters, through which it passes at the average rate of about 105,000,000 gallons per acre per day. From these preliminary filters the water flows by gravity to the slow sand filters, which consist of four beds about 4 feet deep, each having an area of one-third of an acre. When all the units are in operation the rate of filtration is approximately 3,000,000 gallons per acre per day. The effluent from the slow sand filters discharges into a clear water basin having a capacity of about one-quarter of a million gallons. As it leaves this basin the water is treated with liquid chlorine at the rate of about 0.45 of a part per million, and flows to the pumping station, from which it is pumped to the College Hill Park reservoir.

Samples of raw and filtered water were taken at the time of the inspection, and an examination of the results of the analyses of these samples indicates that while the raw water showed high bacterial counts and the presence of B. coli in all of the inoculations tested, the filtered water showed a low count and entire absence of bacteria of the colon type.

As a result of the inspection it was recommended that the authorities in charge of the water supply continue the careful and effective operation of the filter plant at all times.

The water of this supply is used by the New York Central and the Central New England Railroads for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on December 17, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were satisfactory, and that the results of the inspection and analyses of the samples, together with the results of previous inspections and analyses, indicate that the water was of satisfactory quality for human consumption. A copy of the report accompanied this data.

POUGHKEEPSIE (Hudson River State Hospital)

Amended plans for proposed additions and alterations to the water supply system of the Hudson River State Hospital at Poughkeepsie, N. Y., consisting of State Architect's drawing No. 2030, were submitted to this Department for approval by the State Architect on March 20, 1920. The amendment to the original plans approved by this Department on January 17, 1918, consisted only of slight changes in the structural details. After careful consideration by the Engineering Division, the plans were approved on March 20, 1920.

PRATTSBURG

A reinspection of the public water supply of the village of Prattsburg was made by Mr. Earl Devendorf, assistant engineer in this Department, on October 30, 1919, previous inspections of this supply having been made in 1910 and 1914.

Prattsburg is an incorporated village of about 800 inhabitants located in the northeastern part of Steuben county. The water supply of the village is derived from an impounding reservoir of about 700,000 gallons capacity on

East Center creek, supplemented by several springs, and a 6-inch drilled well about 150 feet deep from which water can be pumped directly into the distribution system.

The conditions existing on the watershed of East Center creek were found to be the same as described in former reports, there being some 4 farm houses on the shed, from which the stream undoubtedly receives some indirect pollution at times of heavy rainfall. In one case the stream passes very close to the barns of one of the houses, and there are numerous pastures where cattle have access to the stream. There are seven springs the water from which flows to the reservoir. Most of these are fairly satisfactorily located and protected from contamination, but several of them are not properly protected and are subject to pollution by surface wash. The well is used only as an auxiliary source of supply during such times as the supply from East Center creek and the springs is not sufficient for the needs of the village.

As a result of the investigation it was concluded that the physical and sanitary quality of the present supply is at times of rainfall greatly affected by surface wash, and that the sanitary quality of the spring flow is also liable to be seriously affected at such times.

It was therefore recommended that the village authorities consider the matter of carrying out our former recommendations, and that they employ a competent engineer to make a daily study of the sanitary quality and available quantity of water obtained from the present sources, and of additional sources of supply in order that a satisfactory and economical plant may be developed for augmenting and protecting the present supply, or for developing a new supply adequate in quantity and of satisfactory sanitary quality.

PROMISED LAND

An inspection of the sanitary quality of the water supplies of the fish oil factories at Promised Land, town of Easthampton, Suffolk county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on June 4, 1920.

The water supply of the factories, which is used by about 800 employees, is derived from two dug and two driven wells. The two dug wells and one of the driven wells serve the plant of the Fisheries Products Company, and the other driven well serves what is known as the Triton plant. The dug wells are only a few feet in depth and walled up with open brick work. The water is obtained from them by means of buckets. Neither is protected from surface wash or incidental contamination. One of the driven wells, owned by the Fisheries Products Company, is provided with a 1½-inch Gould hand-pump but not adequately protected from surface wash nor from the return of water pumped from the well. The other driven well, owned by the Triton Company, is protected by a tightly locked shed over which the windmill and a 10,000 gallon tank have been erected. The water is pumped to the tank and flows to the factory through a 2-inch galvanized iron pipe.

As a result of the inspection it was concluded that the two open wells and the driven well provided with a hand pump were not satisfactory as a source of water supply for human consumption, but that the driven well connected with the windmill was apparently yielding a water of satisfactory sanitary quality.

It was therefore recommended that the two dug wells be equipped with pumps and provided with concrete platforms to protect them from surface wash and the waste from the pumps; that the driven well provided with a hand pump be similarly protected; and that the companies in charge of the well consider the development of a new source of supply of unquestioned purity.

QUEENS COUNTY WATER COMPANY

An inspection of the public water supply furnished by the Queens County Water Company to the incorporated villages of Lynbrook, East Rockaway, Woodsburgh, Cedarhurst, and Lawrence; and the unincorporated villages of Valley Stream, Inwood, Oceanside, and Woodmere, in Nassau county; in addition to certain sections of New York city on the Rockaway peninsula in the Borough of Queens, consisting of Far Rockaway, Edgemere, Arverne, Rockaway Park, Bell Harbor, and Neponsit, was made by Mr. Alfred Mullikin, assistant engineer in this Department, on May 21 and June 17, 1920.

The water supply is derived from driven wells at Valley Stream, located south of Harlem road and west of the old Mill road, about one mile southwest of the Valley Stream railway station; and from driven wells at Rockaway park, located on the northern side of Washington avenue opposite Eastern avenue and south of the Long Island railroad tracks. There are two small standpipes, one located at Far Rockaway and one located at Rockaway park, having a combined capacity of 576,500 gallons. These standpipes take the surplus water and act as equalizing reservoirs. The average daily water consumption for the two plants for the year 1919 was 3,900,000 gallons, about 90 per cent of which was from the Valley Stream plant.

The driven wells at Valley stream, the main source of supply, consist of 75 shallow wells ranging in depth from 22 to 32 feet, and 52 deep wells ranging in depth from 143 to 204 feet. The shallow wells are 5 inches in diameter, with the exception of one which is 10 inches in diameter. The deep wells are 6 inches in diameter. In addition to the wells at Valley stream, the company has four 6-inch driven wells located near the Long Island railroad about one mile west of the Lynbrook station, and one shallow well 30 feet deep.

The driven wells at Rockaway park, the auxiliary pumping station which is used during the peak-load pumpage in the summer months of June, July, and August, consist of one 6-inch well 780 feet deep, two 8-inch wells 840 feet deep, and one new 10-inch well 900 feet deep. This last well has 80 feet of 8-inch strainer, and passes through 200 feet of clay and sand and 200 feet of sand and gravel.

On account of the considerable iron content, the water of both pumping plants is filtered. At Valley Stream the water passes through two fountain aerators, and from the aerators flows to two of the three slow sand filters and then to the collecting chambers. The filters have a total area of about 63,000 square feet and with two in use operate at a rate of about 3,500,000 gallons per acre per day. At Rockaway park the water is treated in a similar manner. The filters have a total area of 720 square feet and operate at a rate of about 21 million gallons per acre per day.

There are no houses in the vicinity of the Valley Stream pumping station, and there are apparently no opportunities for the pollution of the water supply. The area of land owned by the company in Nassau county is 285.22 acres. At Rockaway Beach, in the Borough of Queens, the pumping plant is located in a well populated section of Rockaway Park. It occupies practically one city block, covering an area of land measuring about 122 by 188 feet, supplemented by a small strip measuring about 40 feet by 100 feet which is located about 200 feet west of the plant. There is a possibility in this locality of indirect pollution from the private sewers which lead to the bay and from nearby laterals forming a part of the Rockaway Park sewerage system which has an outlet at the 116th street dock.

As a result of the reinspection of the public water supply furnished by the Queens County Water Company, it was found that the public water supply delivered by the Valley Stream pumping station is of a satisfactory physical and saintary quality, but that the water supply delivered by the Rockaway Park wells, which are located in a thickly settled portion of the village and subject to possible pollution by leakage from the sewers and the pollution of the soil in the vicinity, was not of entirely satisfactory quality, and contained some active contamination as shown by the analyses at the time of the inspection.

It was therefore recommended that the authorities in charge of the water supply continue the careful operation of the plant at Valley Stream and supervision of the watershed area, and that at the Rockaway Park plant steps be immediately taken by the authorities to eliminate the sources of pollution if possible, or effectively to purify the water by filtration or by sterilization with liquid chlorine.

QUOGUE

A reinspection of the public water supply furnished by the Quantuck Water Works Company to the villages of Quogue, East Quogue, Westhampton Beach, and Quiogue, of Suffolk county, N. Y., was made on June 2, 1920, by Mr. Alfred Mullikin, assistant engineer in this Department, a previous inspection of this supply having been made by this Division in 1915.

Quogue is located in the southwestern part of the town of Southampton, about 75 miles from New York city. The population of the various villages varies considerably from winter to summer. The total winter population, amounting to 2,350, is increased to 6,000 during the summer months.

The water supply is derived from 16 driven wells, four of which are artesian, located near Quantuck creek, about 1½ miles southwest of Quogue station.

The wells are each 8 inches in diameter and 60 feet deep. The strata through which the wells pass consist entirely of sand. The wells reach what is called a third water level. Four of the wells are artesian, and their casings terminate in brick and cement vaults or manholes 8 feet in diameter and 30 feet deep. These vaults act as collecting chambers, into each of which a 6-inch suction main extends. The vaults extend a foot or more above the ground surface and are covered with circular castiron covers. The ground water level is approximately 4 feet below the surface.

The water company owns or controls about 200 acres of land surrounding the plant. There were apparently no direct sources of pollution at the time of the inspection, the nearest house being about 400 feet southeast of the plant, which is occupied by the man in charge of the pumping station. This house is provided with a toilet which connects to two cemented cesspools, one overflowing into the other. These are each 15 feet in diameter and 15 feet deep, and are cleaned once a year. There is no toilet at the pumping station, the employees using the toilet in the engineer's house. Since the use of a toilet at so great a distance from the station is undoubtedly inconvenient, and may, if new and less careful men are employed, lead to the pollution of the ground near the wells, it would seem desirable that the company consider the installation of a suitable toilet in the station connected by a tight castiron pipe to a cesspool located as far as possible from the wells. Until such a toilet and its appurtenances are installed, the rules against pollution of the ground near the station should be strictly enforced. The houses in the village are provided with either privies or cesspools as there is no sewerage system.

As a result of the reinspection it was found that the water supply at the time of the inspection was of satisfactory physical and sanitary quality; and it was accordingly recommended that the Water company continue to maintain the supply in a satisfactory sanitary condition, and frequently inspect the area in the vicinity of the wells to discover any possible source of pollution and immediately eliminate such possible sources when discovered.

RED HOOK

A reinspection of the public water supply of the village of Red Hook, Dutchess county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on April 26, 1920, previous inspections of this supply having been made by this Division in 1911 and 1919.

Red Hook is a village with a population of approximately 900, located in the northwestern part of Dutchess county, about 3 miles east of Tarrytown. Of the total population, about 80 per cent are served with the public water supply.

The waterworks are owned and operated by the village under the direction of a board of trustees. The supply is derived from 2 dug wells about one-half mile east of the village, from which the water is pumped to a concrete-lined open reservoir on a hill southeast of the pumping station. The average daily consumption is about 45,000 gallons, or 83 gallons per capita.

As a result of the reinspection it was concluded that the authorities in charge of the water supply have only in part carried out the previous recommendations of this Department, and that there remain opportunities for serious contamination of the supply.

It was therefore recommended that the municipal authorities in charge of the water supply carry out at once such of our previous recommendations as have not yet been acted upon; that the manure pile at the south side of the wells be removed; that the reservoir walls be raised or a ditch be dug around the reservoir to prevent surface wash from entering the supply; that the wells be properly screened or otherwise protected to prevent the entrance of small animals; and that the tile casing around the suction main at the wells be repaired.

RENSSELAER

A reinspection of the public water supply of the city of Rensselaer was made on May 12, 1920, by Mr. W. J. Erickson, sanitary inspector in this Department.

Rensselaer, a city of about 13,000 inhabitants, is located on the east bank of the Hudson river directly opposite Albany. The waterworks are owned and operated by the Rensselaer Water Company. Practically all of the city is served by a public sewer system which discharges its sewage into the Hudson river without treatment.

The water supply is derived from the Hudson river. The intake is located opposite the pumping station on the northern edge of the city. After preliminary sterilization and coagulation it is passed through gravity mechanical filters and then again sterilized and pumped into the distribution system. the surplus going to a 6,000,000 gallon reservoir. The average daily consumption is about 1,500,000.

The water is pumped into the coagulation basins which have a total capacity of about 120,000 gallons and give a detention period of about an hour. Alum is fed to the suction of the pump which discharges it into the basin at the rate of 1.5 grains per gallon in summer and of about 2 grains per gallon in winter. The filters are 8 in number, of the original Continental-Jewel type, and are all 15 feet in diameter. The filtering medium consists of about 4 feet of sand underlain with about 6 inches of gravel. The average rate of filtration is about 425,000 gallons per unit per day, or about 105,-000,000 gallons per acre per day.

The two apparatuses for applying liquid chlorine are both of the Electro Bleaching Gas Company type. At the time of the inspection the chlorine was being applied at the point of preliminary chlorination at the rate of about 0.4 parts per million, and at about 0.7 parts per million for the final chlorination.

The results of the analysis of samples of the filtered water show that the filters were efficient in oxydizing the organic matter and in the removal of bacteria, B. coli being absent in the sample of filtered water tested.

As a result of the reinspection it was concluded that the public water supply of Rensselaer, though derived from a grossly polluted source, was at the time of the inspection very efficiently purified by filtration and chlorination, and it was therefore recommended that the Water company continue the careful supervision and operation of the plant.

RHINEBECK

A reinspection of the public water supply of the village of Rhinebeck, Dutchess county, N. Y., was made by Mr. N. H. Baier, sanitary inspector in this Department, on October 25, 1920, a previous inspection of the supply having been made by this Division in the year 1912.

Rhinebeck is located in the west-central part of the town of Rhinebeck, 54 miles south of Albany. The present population is 1,600, of which 75 per cent is served by the public water supply. The unincorporated village of Rhinecliff is also served with water from this supply. The waterworks are owned and operated by the Rhinebeck Water Company.

The water is derived from two 8-inch driven wells, 300 feet deep in broken rock, about a mile east of the village of Rhinebeck, near the east side of Landsman kill. It is carried by an air lift pump to a basin and delivered by pumping through a distributing system consisting of some 11 miles of wrought-iron pipe. A reservoir is 75 feet square and 10 feet 4 inches deep, having a capacity of 435,000 gallons, takes the surplus and acts as an equalizing reservoir. The average domestic consumption of the municipalities is 90,000 to 100,000 gallons per day, or about 75 gallons per capita.

As a result of the reinspection of the public water supply of Rhinebeck it was concluded that the authorities in charge of the water supply have in part carried out the previous recommendations of this Department; that the water supply of the well known as well No. 2 was at the time of the inspection apparently of a satisfactory sanitary quality; and that the water of the well known as well No. 1 is apparently receiving pollution either by the seepage of the water from the creek, particularly at times of high water, through the upper layers of porous soil into the wells, the seepage of polluting matter from privies, leaching cesspools, and pasture land in the vicinity of the wells through the porous soil into the water supply, or the entrance of polluting matter into the water supply through the annular space between the eduction pipe and casing.

It was recommended that all privies within 500 feet of the well be provided with removable water-tight containers; that all cesspools within 500 feet of the wells be made water-tight, and the contents of the cesspools and containers be disposed of at some remote place in a suitable manner; that the well casings be carefully sealed to prevent the entrance of foreign material; and that if after all probable sources of pollution of well No. 1 are removed, the water supply is still found to be of an unsatisfactory sanitary quality, a new source of supply be obtained.

RICHMONDVILLE

A reinspection of the public water supply of the village of Richmondville was made by Mr. W. J. Erickson, sanitary inspector in this Department, on October 14, 1920, previous inspections having been made by this Division in 1912 and 1914.

Richmondville is an incorporated village of 600 inhabitants located in the west central part of Schoharie county, about 50 miles west of Albany. Practically the entire population is served with the public water supply which is owned by the village and is under the direction of the board of water commissioners. There is no public sewer system in the village.

The supply is derived from the headwaters of Cobleskill river by impounding them in a storage reservoir located about 3 miles west of the village. From this reservoir the supply flows by gravity to the consumers. The reservoir has an area of about 1½ acres and is 7 or 8 feet deep. It is surrounded with a wire fence which encloses an area of about 3 acres. There is, however, a cattle path between the fence and the steep slope rising to the state road above. The area surrounding it is used for pasture. Considerable difficulty has been experienced from bad tastes and odors resulting from the decomposition of algae growths and from turbidity at times of

heavy runoff. The watershed tributary to the reservoir is about 1¾ square miles in area, most of which is on the uninhabited slopes of the surrounding hills. There are, however, about 6 houses with a total population of about 16 or about 9 per square mile. The main highway and the Delaware and Hudson railroad pass through the watershed parallel to the stream. A less used highway crosses the upper end of it.

As a result of the reinspection it was concluded that the physical quality of the water supply of Richmondville is depreciated by the high turbidity and disagreeable tastes, and that the purity of the supply is menaced by a farmyard through which the stream passes, and also by a privy near the stream, and other sources of pollution incidental to an inhabited watershed.

It was therefore recommended that drainage ditches be constructed so as to divert surface wash from the reservoir, and a by-pass arranged to divert the muddy water at times of heavy rainfall; that the cattle path be re-located at such a distance that the drainage from it will not enter the reservoir; that the water be treated with copper sulphate to prevent the growth of algae; that the water mains be regularly and thoroughly cleaned in order to prevent the accumulation of sediment in them; that all privies be removed to a distance of 100 feet from any watercourse tributary to the reservoir, so that no drainage may reach the supply either directly or indirectly; that in order to prevent any contamination of the supply at the Patrick farm, the stream be carried past the barnyard by means of tile pipe so laid that no surface wash may enter it; that regular inspections be made of the watershed in order to detect and abate any insanitary conditions found thereon; and that should any difficulty be experienced in carrying out the above recommendations, the village authorities apply to this Department for the enactment of rules and regulations for the protection of the supply from contamination.

RIVERHEAD

A reinspection of the public water supply of the village of Riverhead, Suffolk county, N. Y., was made on May 27, 1920, by Mr. Alfred Mullikin, assistant engineer in this Department, a previous inspection of this supply having been made by this Division in 1915.

Riverhead is located at the head of Great Peconic bay, about 75 miles from New York city. The present population is estimated at 6,450. Of this total population 60 per cent are served with the public water supply and 40 per cent by private wells. The public supply is owned and operated by the Riverhead Water District.

The water supply is derived from five driven wells located in the eastern section of the village about one-half mile east of the railroad station and less than 100 feet north of the Long Island railroad tracks. The water is drawn from the wells by a low lift pump and delivered to an aerator, from which it flows by gravity into a concrete settling reservoir. From this reservoir it is pumped through pressure mechanical filters into a distributing system.

The wells consist of two 8-inch shallow wells driven through sand to a depth of 48 feet, and three 8-inch artesian wells driven to a depth of 88 feet. The deep wells pass through 45 feet of sand, 10 feet of clay, and 33 feet of sand. The shallow wells are said to be provided with 10-foot strainers extending from 17 feet to 27 feet below the surface, and the deep wells with 20-foot strainers extending from 55 to 75 feet below the surface.

The two pressure mechanical filters are of the horizontal type each 8 feet in diameter and 20 feet long. The depth of sand as shown on the plans of the filters is 3½ feet. The rate of filtration, with one filter in operation, figured on the area at the diameter of the cylinder is 160,000,000 gallons per acre per day. With both in operation the rates are of course one-half those just given. No coagulant is used. The filters are washed once a week.

At the time of the inspection samples of water from the public water supply were collected and sent to the Division of Laboratories and Research for examination. The results of the analyses of these samples, together with the results of analyses of samples taken in 1916, will be found in the appended table.

The results of the analysis of the filtered water show a water clear, colorless, and very soft. The figures for nitrogen in its various forms and for oxygen consumed are moderately low, and indicate the presence of small amounts only of decomposing and decomposable organic matter. The amount of iron in the water is relatively small and should not be an objectionable feature. The total bacterial count for the filtered water is low, and the absence of organisms of the colon group indicate that the water is free from active contamination. Samples of water for bacterial analysis only were taken from the raw water and from the settling reservoir. The bacterial count of the raw water is somewhat high but shows a marked decrease for the water after aeration and sedimentation. The absence of organisms of the B. coli type in both these samples indicates the freedom of the supply from active and dangerous contamination.

As a result of the reinspection of the public water supply of Riverhead it was concluded that the authorities in charge of the water supply have not carried out the previous recommendations of this Department, and that there remain certain opportunities for serious contamination of this supply from the numerous privies located within a relatively short distance of the well supply.

It was therefore recommended that the town authorities have all privies within 500 feet of the wells provided with water-tight removable containers, and all cesspools made water-tight; that they require that the privies and cesspools be maintained in a satisfactory condition, and the contents properly removed and disposed of when necessary; that a careful sanitary patrol be maintained at all times over the area within 500 feet of the wells; and that the town authorities consider the construction of a properly designed sewer system to take care of the sewage from the houses in the immediate vicinity of the wells.

ROCKVILLE CENTER

A reinspection of the public water supply of the village of Rockville Center was made on May 18, 1920, by Mr. Alfred Mullikin, assistant engineer in this Department, a previous inspection of the supply having been made by this Division in 1915.

The village of Rockville Center is located in the southwestern part of Nassau county, about 21 miles from New York city. The population of the village is estimated at about 7,000, practically all of whom are served with water from the public supply. The waterworks are owned and operated by the municipality under the direction of the board of trustees.

The water supply is derived from five driven wells located in the eastern section of the village. From the wells the water is pumped into a distribution system consisting of 28 miles of castiron pipe, the surplus going to a steel standpipe 20 feet in diameter and 100 feet high, having a capacity of about 235,000 gallons, which acts as an equalizing reservoir. The average daily water consumption is practically 254,500 gallons, or 36 gallons per capita.

As a result of the reinspection it was concluded that the authorities in charge of the water supply have in part carried out the previous recommendations of this Department, and that there remain certain opportunities for serious contamination of the water supply which may at any time reach the consumers should the chlorine apparatus fail to operate properly.

It was therefore recommended that the pollution of the ground in the vicinity of the wells be prevented as far as possible by providing water-tight containers for all privies near the wells, making all cesspools near them water-tight, and maintaining the privies and cesspools in a sanitary condition; that the village take steps toward the installation of a sewerage

system and the abandonment of all privies and cesspools; that the chlorinating apparatus be operated continuously, and such quantities of chlorine applied to the water as will effectively sterilize the water; and that the treated water be frequently tested by the operator of the plant for excess chlorine in accordance with the instructions of this Department, in order that the necessary quantity of chlorine to be applied may be known.

ROOSEVELT

A reinspection of the public water supply of the village of Roosevelt, Nassau county, N. Y., was made on May 19, 1920, by Mr. Alfred Mullikin, assistant engineer in this Department, a previous inspection of this supply having been made by this Division in 1915.

Roosevelt is located in the town of Hempstead, about two or three miles north of the village of Freeport, and about 27 miles from New York city. The present population is estimated at 3,500. Of the total population, about 50 per cent are served with water from the public supply. The waterworks are owned and operated by the Roosevelt Water, Power and Light Company.

The water supply is derived from a tile well in the northwest corner of the development, and is pumped into two steel water and air pressure tanks from which it is forced into the distribution mains consisting of about 10 miles of castiron pipe ranging from 4 to 10 inches in diameter. The well is 18 inches in diameter and 56 feet deep, and is provided with an 18-inch tile casing and protected at the top by an iron manhole cover which is locked at all times. The water rises in the well to within 17½ feet of the surface of the ground.

From the recent inspection it appears that the recommendations have been only partly carried out; that the privy and cesspool have not been removed, but that a metal container has been provided for the privy, and the contents disposed of at a remote place at proper intervals; that the cistern receives only the water drainage from the leakage of the pumps and is not used for the disposal of sewage; that analyses of water have not been regularly made by the water company; and that the pumping plant is maintained in an untidy condition.

At the time of the inspection samples of water from the public water supply were collected and sent to the Division of Laboratories and Research for examination. The results of the analyses show a water clear, colorless, and fairly soft. The figures for the ammonias are low, indicating the presence of only very small amounts of decomposing and decomposable organic matter. The figures for nitrites, nitrates, and chlorine are rather high, indicating that pollution has reached the supply but has been oxydized and rendered inactive by natural processes of purification during its passage through the soil. Although the total bacterial count is very high for a well water, the absence of bacteria of the colon group indicates that the water supply was, at the time the samples were taken, free from active and dangerous contamination.

As a result of the reinspection it was concluded that the authorities in charge of the public water supply have in part carried out the previous recommendations of this Department but that the plant is not maintained in a neat condition.

It was therefore recommended that the grounds and engine room be kept in a neat and orderly condition, and that the authorities in charge of the water supply maintain a careful sanitary patrol in the immediate vicinity of the pumping plant to prevent any conditions occurring that might deleteriously affect the water supply.

ROSCOE

A reinspection of the public water supply of the village of Roscoe was made on October 28, 1920, by Mr. W. J. Erickson, sanitary inspector in this Department, a previous inspection having been made in 1918.

Roscoe is an unincorporated village situated in the northern part of Sullivan county, about 57 miles west of Middletown, on the New York, Ontario and Western railroad. The public water supply is owned by the Roscoe Water Company.

The supply is derived from a small stream known as Wood brook, a tributary to Beaver kill. The water is impounded in a storage reservoir of about 60,000 gallons capacity, located about 3 miles south of the village. From this reservoir the supply flows by gravity after passing through a crude charcoal filter to the distribution system.

The watershed tributary to the reservoir is about 3 square miles in area and is rather hilly. There is some cultivation and grazing carried on on the watershed. The permanent population is about 35, or about 12 per square mile. During the summer months, due to the influx of summer boarders, the population is increased to about 125, or to 41 per square mile. The cesspool mentioned in the previous report has been put into a better shape than at the time of the previous inspection. A subsurface tile drain has been constructed to take care of the overflow from the cesspool and appeared to be operating efficiently at the time of the inspection. The cesspools of the other boarding houses are located at a considerable distance from the stream and were operating in a satisfactory manner at the time of the inspection. The road passes near the stream and crosses it at four places so that considerable road wash reaches the supply. It does not seem probable that all this wash can be diverted from the stream by drainage ditches. Besides this road wash, the supply is subject to contamination from the comparatively densely populated watershed especially during the summer months.

Samples were collected at the time of the inspection and sent to the Division of Laboratories and Research for analysis, the results of which are as follows:

Color	35	Oxygen consumed	7.5
Odor, hot	None	Chlorine	2.4
Odor, cold	None	Hardness, total	18.2
Turbidity	Trace	Alkalinity	10.0
Ammonia, fr.	.002	Bacteria per c. c. 20°C	18,000
Ammonia, alb.	.076	Bacteria per c. c. 37°C	2,000
Nitrites	.008	B. coli type:	
Nitrates	.200	10 c. c.	3+0—
		1 c. c.	3+0—
		1/10 c. c.	1+2—

These analyses show a water that is soft, practically clear but at times considerably colored. The figure for nitrogen compounds in its various forms and that for oxygen consumed indicated the presence of considerable organic matter. The figure for chlorine is higher than normal for surface water of this origin. The total bacterial counts are high, and the presence of intestinal organisms in as small an inoculation as 1/10 c. c. indicates considerable active contamination.

As a result of the reinspection it was recommended that the water company immediately install and put in operation suitable apparatus for the sterilization of the supply by liquid chlorine; that in order to protect the supply from contamination the intake be extended up the stream to such a point as to be above the principal sources of contamination, or a modern filtration plant be installed; that the water company apply to this Department for the enactment of rules and regulations for the protection of the sanitary quality of the water supply, and strictly enforce such rules and regulations when enacted; and that should the water company find difficulty in placing the watershed in a satisfactory sanitary condition, or producing a safe supply by proper treatment, they consider the development of a new and safe supply.

The water of this supply is used by the New York, Ontario and Western Railroad for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on December 2, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were not entirely satisfactory, and that the results of the inspection and analyses of the samples, together with the results of previous inspections and analyses, indicate that the water cannot be considered to be of entirely satisfactory quality for human consumption. A copy of the report accompanied this data.

ROSLYN WATER COMPANY

A reinspection of the public water supply furnished by the Roslyn Water Company to the unincorporated villages of Roslyn, Albertson Square, South Glenwood, and Old Westbury, in the town of North Hempstead; and Wheatley Hills and Brockville, in the town of Oyster Bay, Nassau county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on June 14, 1920, a previous inspection of the supply having been made by this Division in 1915.

Roslyn is located in the northern part of the town of North Hempstead, at the head of Hempstead Harbor, about 24 miles from New York city. The present population is estimated at 3,500, of whom 80 per cent are served with water from the public water supply. The waterworks are owned and operated by the municipality under the direction of the board of water commissioners.

The water supply is derived from three driven wells located about a mile north of the railroad station on the West Shore Road, near the west bank of Hempstead Harbor. From the wells the water is delivered by pumping through a distributing system consisting of some 39 miles of castiron pipe. A steel standpipe 20 feet in diameter and 60 feet high, having a capacity of 142,000 gallons, takes the surplus and acts as an equalizing reservoir. The average daily water consumption in summer is approximately 300,000 gallons, or 106 gallons per capita; and in winter, approximately 175,000 gallons, or 62.5 gallons per capita. At the time of the inspection there were no apparent sources of pollution of the water supply, although there are numerous houses within 500 feet of the plant in a southwesterly direction. The village is provided with a domestic sewerage system, which takes care of about 50 per cent of the population. Some of the houses, however, are provided with disposal plants of the subsurface irrigation type, and about 20 per cent are provided with privies. The toilet at the pumping station is provided with a 6-inch tile pipe which empties into Hempstead Harbor after passing through a cesspool.

As a result of the reinspection of the public water supply of Roslyn it was concluded that the water supply was of a reasonably satisfactory sanitary quality but that there are certain possibilities of indirect pollution from the numerous houses in the vicinity of the wells.

It was therefore recommended that all sewers within a distance of 500 feet from the wells be of castiron pipe with lead joints; that all cesspools within 500 feet of the wells be made impervious; that all privies be provided with water-tight containers, and the contents disposed of in a remote place at proper intervals of time; and that the authorities in charge of the public water supply maintain a careful patrol over the area in the vicinity of the wells with a view to preventing any possible pollution of the soil by ground water.

ROUSES POINT

A reinspection of the public water supply of the village of Rouses Point was made on September 12, 1919, by Mr. W. J. Erickson, engineering assistant

in this Department, previous inspections of this supply having been made by this Division in 1910, 1911, 1915, and 1918.

Rouses Point is an incorporated village located in the northeastern part of Clinton county, about one mile from the Canadian border. It has a population of about 1,500, practically all of which is served by the public water supply, which is in charge of a board of water commissioners. The supply is derived from Lake Champlain, the intake being 1,200 feet from the shore. The water is pumped directly into the mains after being treated with hypochlorite of lime. The consumption is about 500,000 gallons per day.

The chlorination apparatus was not, however, in operation at the time of the inspection and had not been in operation for several days, due to clogging of the feed pipe.

As a result of the reinspection it was recommended in the report on the inspection dated January 14, 1920, that the hypochlorite plant be abandoned, and duplicate liquid chlorine apparatus be substituted and properly operated at all times; and that pending the securing of such apparatus the present hypochlorite plant be operated efficiently at all times in accordance with our previous recommendations; and that the village consider the installation of some modern method of filtration supplemented by chlorination.

Information furnished to the Department after the report was made indicates that in accordance with our recommendations a liquid chlorine sterilizing plant was installed and put in operation in July, 1920.

SAG HARBOR

Reinspections of the public water supply of the village of Sag Harbor were made on January 8, 1920, and June 31, 1920, by Mr. Alfred Mullikin, assistant engineer in this Department, previous inspections of this supply having been made by this Division in 1909 and 1915.

Sag Harbor is an incorporated village of 5,300 inhabitants located in Suffolk county, at the head of Gardiner's bay, at the center of the eastern end of Long Island, 100 miles from New York city. The water supply is derived by pumping in part from Long pond, located about one mile southwest of the village, and in part from dug and driven wells about midway between the pond and the village. The waterworks are owned and operated by the Sag Harbor Water Company.

As a result of this investigation it was concluded that the present water supply of Sag Harbor is of a reasonably satisfactory quality from the standpoint of freedom from possible contamination, but is unsatisfactory from an aesthetic standpoint, due to odor, taste, and color; that in view of the trouble experienced in the past with the excess of iron in the ground water in this locality, the Sag Harbor Water Company has selected new sources of supply every few years, in unsuccessful attempts to secure a supply of satisfactory quality, which attempts have been made without competent engineering advice, and have consequently resulted in failure to secure returns for the considerable amount of money expended; and that the Sag Harbor Water Company has not carried out the recommendations for correcting the trouble as set forth in former reports by this Department.

It was accordingly recommended that the Water company employ a competent sanitary engineer to study the problem and to advise specifically as to the measures necessary to assure an adequate supply of satisfactory physical and sanitary quality; and that consideration again be given to using the four original wells, with provision for aeration followed by sedimentation and filtration for the removal of excess iron.

SALTAIRE

An inspection of the public water supply of the village of Saltaire, Suffolk county, N. Y., was made on June 17, 1920, by Mr. Alfred Mullikin, assistant engineer in this Department.

The village of Saltaire is located on Fire Island, about 6 miles south of Bayshore. The present population is estimated at 1,000, of whom about 70 per cent are served with the water from the public water supply. The waterworks are owned and operated by the Fire Island Beach Developing Company.

The water supply is derived from a driven well located about one-quarter of a mile southeast of the village dock. The water is pumped through a Roberts pressure filter into a steel tank which rests upon the sand, and is distributed through a network of pipe consisting of about 1½ miles of 2-inch galvanized iron pipe. The daily water consumption is approximately 21,600 gallons per day, or 31 gallons per capita. The supply is derived from a 6-inch flowing well some 400 feet deep driven through sand and clay. The Roberts pressure mechanical filter through which the water passes measures about 5 feet in diameter and 7½ in height, and is operated at the rate of about 192,000,000 gallons per acre per day. Alum is used as a coagulant. The water is filtered on account of fine clay in colloidal suspension.

The area reserved by the development company for the pumping plant consists of about one-half acre, the nearest houses being some 400 feet away. There seem to be no possibilities for direct pollution of the water supply. The area in the vicinity of the well, however, has not been fenced off to prevent trespassing.

As a result of the inspection it was concluded that the water supply was of a satisfactory sanitary quality at the time of the inspection; that there were, however, certain opportunities for contamination due to the possible pollution of the ground in the vicinity of the wells by trespassers; and that the well connected to the village pump, from which a part of the inhabitants obtain their water, is not satisfactorily protected in that the waste water is allowed to fall on the ground near the well.

It was therefore recommended that the authorities in charge of the water supply erect fences around the area in the vicinity of the well to prevent trespassing; that a tight concrete platform be constructed around the village pump and arrangements made to conduct the waste water to some distance from the well before allowing it to soak into the ground; and that the authorities maintain a careful supervision over the watershed area.

SARATOGA SPRINGS

A reinspection of the chlorination plant recently installed for the sterilization of the public water supply of the city of Saratoga Springs was made on December 5, 1919, by Mr. Earl Devendorf, assistant engineer in this Department, previous inspections of this supply having been made by this Division in 1911 and 1914.

The water supply of Saratoga Springs is derived from Loughberry lake, located in the northeastern section of the city. The supply is pumped, after chlorination, directly into the distribution system. The waterworks are owned by the city and operated under the direction of the department of public works.

The chlorination apparatus consists of a duplicate installation of the dry feed type manufactured by the Wallace & Tiernan Company. The gas is forced into the suction line of the pump by means of an injector operating on a water pressure of 80 pounds per square inch. The water consumption at the time of the inspection was estimated to be about 3,000,000 gallons daily. The chlorine was being applied at the rate of 9 pounds per 24 hours, or a rate of about .36 p.p.m. A test for excess chlorine on a sample of the treated water gave a distinct reaction by the starch iodide method. Daily records are kept of the pumpage and of the amount of chlorine applied as determined by scale weighings.

At times the water supply of Saratoga Springs is subject to objectionable tastes and odors due to algae growths in the reservoir. The supply is also open to accidental, incidental, or willful contamination by chance visitors to the lake and from permanent residents upon the watershed. It has been

previously recommended by this Department that steps be taken to purify this supply, but until the installation of the chlorination plant in 1919 no action had been taken by the city authorities to carry out the recommendations. The installation of this chlorination plant is a step in the right direction, and if properly operated should protect the supply from all ordinary dangers of contamination. It should be pointed out, however, that the chlorination of the supply will not improve the physical quality of the water, particularly at times when troubles are experienced with tastes and odors therein. In order to secure a supply of satisfactory physical as well as sanitary quality, it is essential, as has been previously pointed out, for the village to install a modern filtration plant supplemented by aeration.

As a result of the reinspection it was recommended that the city authorities continue to operate the chlorination plant with care and efficiency at all times, and that consideration be given to the installation of a modern filtration plant supplemented by aeration in order to improve the physical quality of the supply.

The water of this supply is used by the Delaware and Hudson Railroad. Data regarding the supply were furnished to the United States Public Health Service on October 18, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were fairly satisfactory, and that the results of the inspection and the analyses of the samples, together with the results of previous inspections and analyses, indicate that the water is of satisfactory quality for human consumption, but that a filtration plant should be installed to improve the physical quality of the water. A copy of the report accompanied the data.

SARATOGA SPRINGS (Bottled Water)

An inspection of the sanitary quality of the waters bottled by the Saratoga Springs Water Corporation of Saratoga Springs, N. Y., was made by Mr. Henry Ryon, assistant engineer in this Department, on August 19. 1920.

The waters bottled by this corporation are the Ferndell water, the Geyser water, the Coesa water, and the Hawthorne No. 2 water. The Ferndell is a soft water from shallow wells in gravel, and the Geyser, Coesa, and Hawthorne No. 2 waters are all natural carbonated waters, high in mineral content, obtained from deep wells in rock.

The wells from which the Ferndell water is derived are located in a flat piece of land about 2 miles south of the city of Saratoga Springs. The wells are each 1¼ inches in diameter, fitted with 30-inch strainers, and are 33, 34, and 39 feet deep respectively. They are located between 40 and 60 feet southeast of the bottling plant, and connected to the plant by pipes laid beneath the surface of the ground. The soil in the vicinity is a fine sand containing some loam. There are, apparently, no permanent sources of pollution within ¼ of a mile of the wells. A public road passes about 150 feet east of the wells and there is a public comfort station located about 300 feet north of them. It was stated, however, that this comfort station has never been used. A toilet is provided in the bottling plant and drains to a swamp about one-third of a mile southeast of the wells. The connection from the toilet to the swamp is said to be of castiron pipe laid with lead joints. This pipe passes within about 35 feet of the nearest well.

The water used for washing the bottles at the plant is obtained from a small stream which passes the plant a short distance to the west. The watershed of this creek is comparatively free from permanent sources of pollution, but is, as was apparent at the time of the inspection, subject to accidental and willful contamination by trespassers.

The water is delivered to the purchaser in 5-gallon demijohns and 2-quart bottles. The empty 5-gallon demijohns when returned to the plant are taken first to a washing machine which consists of a revolving wheel having about 12 vertical jets on its periphery over which the demijohns may be inverted.

The wheel revolves in about two minutes. The temperature of the water at the point where the demijohns are placed over the jets is about 120°F. and gradually increases to 180°F. at a point diametrically opposite the place where the demijohns are placed on the wheel and then gradually decreases again to about 120°F. at the point where the demijohns are removed from the jets. No attempt is made to wash the outside of the demijohns. After the bottles have been thus rinsed and removed from the wheel containing the jets they are placed on a roller conveyor leading to the bottling taps, where they are filled. They are then passed along the conveyor for a distance of a few feet and corked and capped by hand. The corks before being placed in the bottles are sterilized in a low pressure autoclave capable of carrying about two or three pounds pressure. The corks are taken directly from this sterilizer and placed in the bottles.

The small 2-quart bottles when returned to the plant are treated in a similar manner to the large demijohns, except that the bottles are carried over a series of jets by a belt operating in a horizontal plane instead of being placed over jets on a wheel. The temperature of the water is said to be maintained at about 120°F. The small bottles are, however, before being refilled, placed in an autoclave and sterilized at a pressure of three or four pounds for a few minutes. They are lifted out of this autoclave and placed on a roller conveyor leading to the filling taps, where they are filled. They are then placed in the capping machine and capped. No attempt is made to sterilize the caps.

When new 2-quart bottles are received at the plant, however, they are passed through what is known as an alkali machine before being used. This machine consists of two vats, one containing a 4 per cent caustic solution and the other clear rinsing water. The liquid in both of these vats is said to be maintained at a temperature of about 120°F. The bottles are carried through the machine by an endless chain conveyor, passing first through the alkali solution and then through the rinsing water. After removal from the alkali machine the bottles are treated in the same manner as the bottles returned by the consumers.

No attempt is made to wash the outside of the bottles, although the arrangement of the washing machine is such that the jets of water play on the outside of the bottles while the inside is being rinsed.

The Geyser water is obtained from a well said to be about 300 feet deep, located under the bottling plant, about two miles south of Saratoga Springs on the road to Ballston Spa. The well casing is said to be 6 inches in diameter. The suction pipe is 1¼ inches in diameter and is said to extend to a point about 250 feet below the surface of the ground. The 6-inch casing is of course driven only to the rock. Under normal conditions the well flows. In order to supply the demands of the plant, however, it is necessary to pump, and for this purpose a small electrically driven deep well pump has been installed over the well and arranged to lift the water from it into a closed glass lined tank, from which it flows by gravity to the bottling machines.

The process of washing, filling, and capping the bottles is in general carried on by automatic machinery. In some cases, however, where the water has been heated in the bottles and they have consequently become coated on the inside with a deposit of calcium carbonate, they are first cleaned with hydrochloric acid. The bottles when received at the plant, with the exception of those thus treated, are placed first in the alkali machine where an endless chain conveyor carries them through the alkali vat containing a 4 per cent solution of alkali at a temperature of 120°F., then through the rinsing vat containing clear water at the same temperature, and from the rinsing vat on to a platform, from which they are taken and placed over vertical jets and revolving brushes which wash the interiors. From the washing machine they are passed to a gas machine, where each bottle is filled with carbon dioxide gas in order to prevent the deposition of iron salts which would occur if the carbonated mineral water were placed in bottles containing air. From the gas machine the bottles are carried by a conveyor to the filling machine, where they are filled with water, and then

passed to the capping machine, where they are automatically capped. No sterilization of the bottles, other than the washing with the alkali solution and hot water, is attempted. The caps are not sterilized in any manner.

The Coesa water is obtained from a well located about ¼ of a mile south of the Geyser well. This well is said to be about 600 feet deep. The water is lifted from it by a pump similar to that used at the Geyser well and discharged through a pipe to the bottling plant, where it is bottled with the same machinery used for the bottling of the Geyser water.

The Hawthorne No. 2 water is obtained from a well about 400 feet deep located approximately ¼ of a mile south of the Coesa well. The water is handled in a similar manner to that from the Coesa well and bottled with the same machinery.

There is apparently no source of permanent pollution within a reasonable distance of any of these three wells. The toilets in the bottling plant under which the Geyser well is located are connected by a castiron pipe which discharges into Coesa creek, about 100 feet below the plant. The water for washing the bottles is obtained from an infiltration gallery on the north side of this creek at a point above this sewer outlet.

Samples of the water from all the wells were taken at the time of the inspection and sent to the Division of Laboratories and Research for examination. The results of the examination are as follows:

	Bacteria per cc count	B. coli in 10 cc	1 cc	1/10 cc
Ferndell water from bottling tap 5-gal. bottle Ferndell "A"	1	0+3—	0+3—	0+3—
Ferndell water from 5-gal. demijohn "B," bottled Aug. 19, 1920	2	0+3—	0+3—	0+3—
Geyser spring water bottling tap "C"	0	0+3—	0+3—	0+3—
Geyser spring "D," 3:30 P. M.	0	0+3—	0+3—	0+3—
Coesa spring "E"	2	0+3—	0+3—	0+3—
Hawthorne No. 2 spring water	250	0+3—	0+3—	0+3—
Hawthorne No. 2, rec'd in 1-qt. bottle sealed with tin cap marked "Hawthorne No. 2"	0	0+3—	0+3—	0+3—
Geyser water, 1-qt. bottle as it is sold, sealed with tin cap marked "Geyser"	26	0+3—	0+3—	0+3—
Coesa water, 1-qt. bottle as it is sold, sealed with tin cap marked "Coesa"	5	0+3—	0+3—	0+3—
Ferndell water, rec'd in 2-qt. bottle as it is sold, sealed with tin cap marked "Ferndell"	1	0+3—	0+3—	0+3—

It will be noted from an examination of the results of the analyses that the counts are in all cases very low, in most cases the water being practically sterile. In no case was the presence of bacteria of the colon type indicated in any of the inoculations tested. Since a complaint was received by this Department regarding the precipitate found in bottles of Geyser water as delivered to purchasers, an examination of this water to determine the cause of this precipitate was made. The report of Mr. L. M. Wachter, chemist of the Division of Laboratories and Research of this Department, on this matter, seems to indicate that the dark precipitate found in the bottles of Geyser water is due to the precipitation of iron and not to any fault in the washing of the bottles. This iron is always precipitated when the water from the Geyser well is exposed to the air, and it is probable that the cause of the precipitation of the iron in these bottles is due to the imperfect removal of the air from the bottles before they are filled. This removal, as explained above, is done while passing through the automatic bottling machines by filling the bottles with carbon dioxide, and the application of too small a quantity of carbon dioxide would undoubtedly leave some air in the bottles. The possibility that the precipitation of the iron might have been caused by the leakage of carbon dioxygen, with which the water is

impregnated, out of the bottles, cannot be entertained, because it was found that the water in which there was a considerable precipitate of iron was still fully charged with gas when the caps were removed.

SAUGERTIES

A reinspection of the public water supply of the village of Saugerties was made on October 14, 1920, by Mr. A. I. Howd, assistant engineer in this Department, previous inspections of this supply having been made by this Division in 1909 and 1915.

Saugerties is a village with a population of about 4,000, located in the northeastern part of Ulster county, about 42 miles south of Albany. Of the total population, practically all are served with the public water supply. The waterworks are owned and operated by the municipality under the direction of a board of water commissioners.

The public water supply is derived from an impounding reservoir on the Plattekill creek about 5 miles northwest of the village. From the reservoir the water is delivered by gravity through a distributing system consisting of about 18 miles of mains. The water consumption is about 320,000 gallons daily, or 80 gallons per capita.

The Plattekill creek above the point of intake of the public water supply has a watershed area of about 17 square miles. About 75 per cent of this area is wooded and the remainder is farming country. There are 89 houses on the watershed, 21 of which are unoccupied. The majority of the houses were a considerable distance from any stream.

As a result of the reinspection it was concluded that the authorities in charge of the water supply have taken commendable action in improving the sanitary condition of the watershed, but that in view of the relatively large population on the watershed the supply is subject to accidental or willful contamination.

It was therefore recommended that the village authorities install and operate an apparatus for the sterilization of the supply with liquid chlorine, and that they make regular, frequent, and thorough inspections of the watershed and continue their efforts in improving the sanitary condition of the watershed.

SCHENECTADY

In the spring of 1920 the Engineering Division of the New York State Department of Health was called upon to investigate an epidemic of gastroenteritis, followed by an outbreak of typhoid fever, in the city of Schenectady, N. Y., which occurred subsequently to the gross pollution of the public water supply of the city by the water of the Mohawk river. The results of the investigation, as outlined below, are interesting because of the clearly defined manner in which the effects follow the cause, and also because they illustrate how easily the trouble could have been avoided by the careful supervision of the waterworks, and how the effects might have been mitigated had the first warnings been heeded.

The matter was brought to the attention of the Division of Sanitary Engineering by the district sanitary supervisor, Dr. C. C. Duryee, on March 20, 1920, when information was received that on March 15 and a few days following the number of cases of gastroenteric disturbances in the city had greatly increased above the number normally occurring; and that this increase had followed a noticeable turbidity in the water, which had been greatest on the night of March 13 and during March 14, and had gradually disappeared after the latter date. Although the information was not received until several days after the incidence of the largest number of cases, Mr. Henry Ryon, assistant engineer in this Department, was at once sent to investigate the condition of the water supply to determine whether or not it had been, or was, such as would be likely to cause the disturbances

reported, and Mr. Earl Devendorf, assistant engineer, was later detailed to assist him. On the date of the first inspection, March 20, 1920, the water was clear and colorless, and it was therefore necessary to depend largely on what could be learned from the officials and residents of the city for information regarding its alleged unsatisfactory condition. Most of the residents interviewed confirmed the statement above regarding the marked turbidity of the water and the gastroenteric disturbances which followed. The city officials stated that so far as they knew the turbidity was not very noticeable, and that it consisted of fine sand in the water, owing probably to the disturbed condition of the ground water flow caused by the recent thaws and the high water in the river. They also stated that the city chemist and the city bacteriologist had both recently examined the water and reported that it was perfectly safe for consumption without treatment. At the plant, little could be learned except that the water had risen very high in the wells on the 13th and 14th of the month. The man in charge of the plant stated that he had noticed a little turbidity in the water, but that he had not thought it of any importance, and could not remember on exactly which dates it had occurred. He insisted that the turbidity had been due to the low vacuum on the pump suctions and the higher pumping rate. This rate, however, was estimated to be only about 10 per cent above the average.

Samples of the water for bacterial and chemical examination were taken at several points by the department engineer and carried immediately to the laboratory for examination. At the end of one day, inoculations for the determination of the presence of B. coli indicated the probability of the presence of those organisms in all the samples, and in as small a quantity as 1/10 c.c. in one sample. It was also noted that the chlorine content of the chemical sample was about twice that of the content of the samples previously taken. These results, together with the fact that the explanation given by the attendant in charge of the waterworks as to the reason for the turbidity in the water seemed inadequate to the engineer making the investigation, made it appear advisable that a thorough inspection of the plant and wells should be made. This inspection was made on March 24. The results of the examination can be clearly explained only by a detailed description of the arrangement of the pumping station, the wells, and the connecting pipes.

The water supply of the city of Schenectady is obtained from three dug wells at the waterworks pumping station, located about 2½ miles west of the city on a flat piece of land lying between the south bank of the Mohawk river and the hills which rise abruptly from the plain about 1,000 feet south of the river. Wash borings made a short time before the investigation indicate that the soil in the vicinity of the waterworks consists of clayey loam from the surface to a depth of 12 feet, the lower 2 feet containing considerable gravel; from a depth of 12 feet to a depth of 60 feet, a sharp coarse sand mixed with gravel containing a considerable proportion of stones several inches across; and below 60 feet, an impervious clay. Whereas the surface of the ground is practically level, the surface of the impervious stratum beneath the gravel appears to slope gently toward the wells from three directions, and away from the wells or toward the river, or northerly direction, in the fourth. The wells extend through the upper 12 feet of loam into the gravel stratum from which they receive their water. They are arranged in a line parallel to the river and about 400 feet from it. A highway leading into Schenectady, and the Erie canal, both parallel to the Mohawk river, lie between the wells and the river, the canal being the nearer to the stream.

Well No. 1, the oldest and most westerly of the three, is 60 feet long, 8 feet wide, and about 42 feet deep. The walls, of masonry and of considerable thickness, are built of large cut stones, the lower courses apparently having been laid without mortar. The roof is formed by a well constructed arch about 22 feet below the surface of the ground. Near the center, a short section of the well extends to a point within a few feet of the surface of the ground, and a manhole in the roof of this section gives access to the well for inspection. The bottom of the well is the gravel encountered at

that depth when the well was dug. At the time of the inspection the water in the well was clear and colorless. The walls and roof of the central section were wet, but there were apparently no material leaks. The places where the old suctions, described below, from the pump house to the river, had passed through the walls of the well were visible, but the patches which closed the openings originally occupied by the pipes were apparently tight. Open joints between the stones forming the walls of the well were clearly visible below the water line.

Wells Nos. 2 and 3 are circular in form, 42 feet in diameter, and about 40 feet deep. The walls are of concrete, and the roofs are apparently made of reinforced concrete supported on steel beams which span from the walls to the Phoenix columns set in the centers of the wells. As in the case of well No. 1, the bottoms are formed by the natural gravel. These two wells were, at the time of the inspection, in an entirely satisfactory condition. The three wells are connected by castiron siphons said to be 16 inches in diameter, one between well No. 1 and well No. 2, and the other between well No. 2 and well No. 3, arranged to allow the water to flow from one well to the other. The pump suctions connect to wells No. 1 and No. 2. As near as could be learned from the available records, the level of the water in the wells, with the pumps running, is usually about 210 feet above mean tide, and that in the river is 2 feet higher, or about 212 feet above mean tide. At times however the water rises as much as 20 feet above these levels.

Originally, the pump house now in use contained two large steam-driven reciprocating pumps which were connected to well No. 1, and were also provided with two 24-inch suctions extending to the Mohawk river. These two suctions passed out through the wall of the basement of the pump house about 18 feet below the surface of the ground, extended through two converging pipe galleries to well No. 1, crossed through the raised central section of that well, mentioned above, and continued in two parallel pipe galleries to a manhole at the road about 30 feet north of the well. From this point the pipes extended through the ground without galleries to the river. The galleries are about 6 feet across and 8 feet high. The walls and arched roofs are constructed of brick. The galleries are not paved, the bottom being formed by the gravel encountered in excavating them. Two manholes, one on the south side of well No. 1 and the other at the side of the road about 30 feet north of the well, afford access to the galleries. The suction pipes had been removed from the galleries, and the holes through the walls of the well and through the wall of the basement of the pump house had been sealed with concrete and brick. The portions of the pipes from the gallery to the river still remained in place. One of these pipes, the westerly one, was sealed with concrete. The other pipe, the easterly one, was apparently open from the river to the gallery.

The existence of these galleries and the fact that they could be reached by manholes, the covers of which were made visible by the melting of the snow, became known to the engineers from the Division of Sanitary Engineering of the State Department of Health on March 24, and they were immediately inspected. The galleries between the well and the road had apparently been full of water carrying considerable suspended matter a short time previous to the inspection. The bottoms were covered with a slimy deposit of black silt to a depth of from one-half inch to 2 inches, and the upper surfaces of all projections of the brick work to a height of about 8 feet above the bottom of the gallery were likewise covered with a deposit of the same material, the quantity of deposit being less on the higher projections. The deposit of sediment was practically uniform over the bottom of the galleries, except at points in both galleries about 10 feet from the north wall of the well. Here, in each gallery, there were several holes from 6 to 10 inches across on the top and extending from 1 foot to 2 feet down into the gravel in which the stones were perfectly clean, as if a swift stream had passed down through the coarse gravel at these points and carried with it all the silt and fine material.

The elevation of the bottom of the galleries is approximately 222.5 feet above mean sea level, or about 10.5 feet above the normal river level. An examination of the records of the river elevations kept by the lock tender at Barge Canal lock No. 8, about a quarter of a mile west of the pumping station, revealed the fact that the river had risen from an elevation of about 214 feet at noon on March 13 to 228 feet at midnight on that date, over one-half of the rise, 9 feet, occurring between 2 and 3 o'clock. The river reached its maximum elevation of about 230 feet at 4 P. M. on March 14; and after that time the elevation gradually fell, reaching 224 on the 20th, and 222 feet on the 21st of the month. The elevation of the water in the wells, figured from the record of the vacuum on the pump suctions, rose more slowly than that of the water in the river, the maximum rate of the rise being about 1 foot per hour. The river elevation was, therefore, for a considerable time, several feet above the elevation of the water in the wells. On the afternoon of the 13th this difference varied from 6 feet at noon to about 14½ feet at 3 P. M., dropping again to 7 feet at midnight. During the entire day of the 14th the elevation of the river was a little over 6 feet above the elevation of the water in the wells, and from that date on gradually decreased, the difference on the 20th being only about 9 inches.

Compared with the elevation of the bottom of the pipe gallery, these figures indicate that the river surface was above the floor of the gallery from 3 o'clock on the afternoon of March 13 until March 20, and that during the afternoon of the 13th and during the 14th the river surface was between 6 and 8 feet above the bottom of the gallery while the water in the well remained below the bottom of the gallery.

Apparently, therefore, from the 13th to the 20th of March, there was nothing to prevent the polluted water of the Mohawk river from flowing from the river to the galleries through the open 24-inch suction line, then along the galleries, and as indicated above, down through the wash holes a few feet from well No. 1, and through a few feet of coarse gravel into the well either by way of the joints in the stonework or up through the open bottom. The largest rate of flow into the well by this means would, of course, have occurred on the 13th and 14th of the month, when the difference in elevation between the surface of the river and the surface of the water in the well was greatest, and would have gradually decreased as the difference in elevation became less. This is in general accordance with the evidence as to the turbidity in the city water, which is said to have been the greatest on the night of the 13th and during the 14th, gradually becoming less during the week and finally disappearing about the 19th or 20th.

An examination of the results of the analyses of the samples of water from the wells and system taken on March 20, several days after the high water, indicates that the water at the wells still contained polluted matter on that date, as shown by the examination for the presence of B. coli. The water in the city mains, probably pumped some hours before the samples were taken, and thus representing the condition of the water at the wells some time before the time of the inspection, showed evidences of being more polluted than the water taken direct from the wells at about the same time, as indicated by the presence of organisms of the B. coli type in 0.1 c. c. The examination of samples taken direct from the wells on March 24th showed that some polluting matter still remained in well No. 1 on that date, while the water from wells Nos. 2 and 3 was practically free from bacteria. All this evidence confirms the conclusion that the polluting matter entered well No. 1.

The possibility of the pollution of the city water supply by the river water could have been prevented had the waterworks officials been familiar with the piping at the station, given due attention to the elevations of the river, and stopped using the water from well No. 1 when the water of the river rose so high as to endanger the quality of the water from that well. This could have easily been done by closing a valve and breaking the seal of a siphon. Even if they had not observed the river elevation, the turbidity of the water which they noticed should have warned them that some unsatisfactory condition existed which they should have taken immediate steps to correct.

The open suction line and the probability of its being the cause of gross pollution of the water was at once pointed out to the superintendent of water of the city, and he immediately had the open pipe sealed. A report on the conditions was sent to the city authorities shortly afterward, in which it was recommended:

1. That the ends of the two 24-inch suctions in the gallery manhole between well No. 1 and the river be sealed with castiron flanges and suitable tight gaskets.
2. That at least two sections be removed from each of the old suction lines to the river at points between the gallery manhole and the high water line of the river and at a distance of not less than 30 feet from the manhole, the four ends thus exposed sealed with castiron flanges and tight gaskets and the excavation refilled with impervious material.
3. That the pipe galleries, unless removed entirely, be thoroughly cleaned.
4. That as previously recommended, the sewer carrying the sewage from the toilets in the pumping station and the chief engineer's residence be re-located as far from the wells as possible, and laid with castiron pipe with leaded joints and a suitable grade and at a reasonable distance below the surface of the ground.
5. That the work be carried out under careful and strict engineering supervision.

These recommendations, excepting No. 4, were carried out by the city authorities. The removal of the possibility of further pollution did not, of course, prevent the damage done by the gross pollution and infection of the water between March 13 and March 19. An epidemic of gastroenteritis disturbances occurred on March 15 and lasted for several days. On March 28, 15 days after the first pollution of the water, or 10 days after the day on which the inflow of polluted water into the river ceased, the records of the Division of Communicable Diseases indicated that one case of typhoid was reported. Others followed. On April 1 the onsets of eight cases occurred, and for the next week the number of onsets ranged from two to six, the number gradually decreasing. The last case was reported as occurring on the 19th. In all, there were 53 cases, 3 of which terminated fatally.

The water of this supply is used by the New York Central and Delaware and Hudson Railroads for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on November 19, 1920, and included, in addition to the analysis of a sample of the supply, the statement that at the time of the inspection the conditions surrounding the supply were satisfactory, and that the results of the inspection and analyses of the samples, together with the results of previous inspections and analyses, indicate that the water is of satisfactory quality for human consumption. A copy of the report accompanied this data. Based on this information the United States Public Health Service on November 17, 1920, issued a certificate permitting the use of the water for drinking and culinary purposes.

SCHENECTADY COUNTY TUBERCULOSIS SANATORIUM

An investigation of the water supply at the Schenectady County Tuberculosis Sanatorium was made on January 15, 1920, by Mr. Earl Devendorf, assistant engineer in this Department.

The plans for the present water supply were approved by this Department on October 15, 1918, and consisted of a small reservoir formed by a dam, and a pump house containing coagulation and sterilizing devices, pumping equipment, and pressure filters. The water is pumped after sedimentation and sterilization through pressure filters, where it is treated with alum, to under-

ground storage tanks. The rate of application of chlorine, according to the statement of the superintendent, varies from .9 to 1.6 p. p. m. available chlorine.

This investigation was made as a result of a reported outbreak of intestinal trouble at the institution in which 10 patients out of the total population of 108 were affected. The outbreak of intestinal trouble was first brought to the attention of the authorities of the institution on January 8, 1920, through complaints of several of the patients. Workmen were engaged from December 1, 1919, to January 9, 1920, in replacing a section of the force main, and about January 1 and 8, respectively, the reservoir was drawn down to enable the workmen to make proper connections. About December 1 one of the two 24-inch Roberts pressure filters cracked and was put out of service, since which time only one filter has been in operation.

As a result of the above investigation it was concluded that the outbreak of intestinal trouble at the institution was occasioned by the breaking of one of the filter units, and the making of changes in the distribution system which gave opportunity for pollution to enter the distribution system, and by intermittent and ineffective chlorination of the water supply. It was accordingly recommended that the broken filter be replaced and put in operation as soon as possible; that the hypochlorite solution be applied at all times in proper amounts, and that the present method of applying hypochlorite solution be improved by extending the end of the pipe through which the hypochlorite solution enters the sedimentation chamber to the open end of the suction pipe, or by introducing the hypochlorite solution directly into the suction line of the pump through a constant head orifice tank in which only the settled hypochlorite solution is allowed to enter, the solution being mixed in a different container.

SCHENEVUS

A reinspection of the public water supply of the village of Schenevus was made by Mr. W. J. Erickson, sanitary inspector in this Department, on October 15, 1920, previous inspections of this supply having been made by this Division in 1908 and 1915.

Schenevus is a village of about 560 inhabitants. It is located in the southeastern part of Otsego county, about 15 miles northeast of Oneonta, on the Delaware and Hudson Railroad. The public supply, which is used by about 90 per cent of the inhabitants of the village, is owned and operated by the Schenevus Water Company.

The supply is derived from a small stream known as Sparrow Hawk brook. The water is impounded by three reservoirs located 4, 2¼, and 2 miles from the village respectively. From the upper storage reservoir the water flows over the natural stream bed to the second or intake reservoir. From this intake reservoir the water is piped to the distributing reservoir a short distance below, from which the water is supplied by gravity through about 5 miles of water mains varying from 4 to 6 inches in diameter. The average consumption is about 40,000 gallons daily. A spring located in a field just northeast of the village supplies some 15 houses.

The watershed tributary to the brook supply is about 1½ square miles in area. The stream flows through a long narrow valley the sides of which are practically cleared of timber and devoted to agriculture. There are 8 occupied houses and a schoolhouse on the watershed, with a total population of about 20, or about 13 per square mile. Most of these live in the village, occupying the houses on the watershed during the summer months only.

The sanitary conditions on the watershed are about as described in the previous report. All the privies along the stream are located 50 or more feet from the stream and are provided with concrete containers, the contents of which are removed and buried yearly by the water company. A good proportion of the land has been purchased by the water company and

so is under their control. The supply is, however, subject to wash from cultivated fields and pasture lands. The vitrified tile has been delivered at the Jeffrey farm but has not yet been laid, though it is the intention of the company so to do in the near future. This tile is to be laid so as to divert the stream around the farm building and thus prevent contamination of the supply.

The spring is located in a field and fenced to prevent trespassing. It is covered with a substantial slate covered hip roof. It appears that there is no possibility of contamination except from surface wash from the surrounding fields entering through the cracks in the collecting basin.

It was therefore recommended that the company consider the installation of some modern method of water purification for improving the sanitary quality of the supply.

SCHOHARIE

A reinspection of the public water supply of the village of Schoharie was made on October 13, 1920, by Mr. W. J. Erickson, sanitary inspector in this Department, a previous inspection of this supply having been made in 1915.

Schoharie, which is a village of about 1,000 inhabitants, is located in Schoharie county, about 35 miles west of Albany. Practically all of the population use the supply which is owned by the village. The water supply is derived from a spring located on the side of a hill about a mile and a half northeast of the village. At times the spring supply is augmented by pumping from Fox creek.

The spring issues from a cavern in a small ravine on the side of the hill. From this cavern the water flows to a small intake reservoir about 50 feet below. There are no permanent sources of pollution on the watershed above the spring; this area, however, is largely used for pasturage or cultivated. The immediate vicinity of the spring and reservoir is fenced, but it is possible that at times surface wash reaches them from the surrounding pasture lands. It seems probable that this wash from pasture lands and from trespassers are the only sources of pollution.

The Fox creek, from which the auxiliary supply is derived, is the outlet of Warner's Lake. From the lake the stream flows through several communities. The area of the watershed is about 110 square miles on which there is a population of about 4,350, or 39 per square mile. The stream was followed from the intake to Berne, a distance of about 11 miles above. At Berne there are four privies which discharge directly into the stream. At West Berne there are about 10 privies located from 10 to 25 feet from the stream, and a slaughter house with carcasses and excreta strewn in the rear near the edge of the bank above the stream. At Gallupville, about 4 miles above the intake, conditions are not as serious as at West Berne. There are several privies near the millrace. The creamery mentioned in the previous report has been abandoned. Besides these direct instances observed, it seems probable that the main stream and its tributaries are subject to pollution from farms and pasture lands along their banks. The water of the creek cannot be considered as suitable for a public water supply unless the direct sources of pollution are eliminated and the water properly treated.

As a result of the reinspection it was recommended that the spring supply be adequately protected by the construction of drainage ditches to prevent surface wash from entering the spring and intake reservoir, that the village authorities take immediate steps to develop an additional supply of satisfactory sanitary quality so as to render the auxiliary use of Fox creek unnecessary, and that pending the development of the additional source the Fox creek supply be efficiently sterilized should the use of this source become necessary.

SCHROON LAKE

A reinspection of the public water supply of the village of Schroon Lake was made on July 31, 1920, by Mr. Earl Devendorf, assistant engineer in

this Department, previous inspections of this supply having been made by this Division in 1914 and 1916.

The village of Schroon Lake is an unincorporated village in the southern part of Essex county, at the northern end of Schroon Lake. The resident population is estimated at 300, while the summer population is several times this number. The water supply is owned and operated by the Schroon Lake Water Company. The supply is derived by gravity from a small spring fed reservoir located in the hills some two miles west of the village, supplemented by water from Bullet pond.

As a result of the above investigation it was concluded that no steps have been taken to develop the supply from King brook and Horseshoe pond brook, and that while the water taken from both the reservoir and from Bullet pond is not subject to any permanent sources of pollution, it is, however, as is true of all surface supplies, subject to the accidental or willful contamination from trespassers upon the watershed, and in the case of the reservoir subject to surface drainage from the surrounding pasture land.

It was therefore recommended that the water company develop an adequate supply of water of unquestioned quality, either by acquiring new sources of supply as recommended in the previous reports, or by the treatment of the present supply, and that as previously recommended the company secure the services of a competent sanitary engineer to advise and aid in carrying out these improvements.

SEA CLIFF

A reinspection of the public water supply furnished by the Sea Cliff Water Company to the village of Sea Cliff and the unincorporated villages of Glen Head and Glenwood, Nassau county, N. Y., was made on July 15, 1920, by Mr. Alfred Mullikin, assistant engineer in this Department, a previous inspection of this supply having been made by this Division in 1915.

Sea Cliff is located in the northwestern part of the town of Oyster Bay, about 29 miles from New York city. The winter population is about 2,500, and increases in the summer to about 5,000, due to the influx of residents from the city. The waterworks are owned and operated by the Sea Cliff Water Company. There are eleven 6-inch wells, from 65 to 85 feet deep, of which two only, about 60 feet deep, are in use; three 10-inch wells about 55 to 60 feet deep, two only of which are in use; and three 8-inch wells about 55 to 60 feet deep, all of which were driven in the year 1918. The stratum through which the wells pass is white sand.

The watershed tributary to the supply is on a precipitous slope and is sparsely populated, the houses consisting of high class cottages. Possibilities for indirect pollution were not apparent at the time of the inspection, with the exception of the sewer line leading from the pumping station to the harbor. This sewer line consists of a 4-inch castiron pipe from the building for a distance of nearly 40 feet, which is about half its length, the remainder being of tile pipe. It is possible that sewage may escape into the ground from the joints in the tile pipe. The nearest buildings are about 250 feet from the wells and it would seem that there is little opportunity for contamination of the well water in the immediate vicinity of the wells from the buildings. There is no sewerage system for the village. Privies are in general use, and in some cases cesspools have been constructed. Private sewers which formerly ran into the harbor have been practically all abondoned.

As a result of the reinspection it was recommended that the authorities in charge of the water supply eliminate all possible sources of pollution by reconstructing the sewers within 500 feet of the wells with castiron pipe laid with lead joints; by carefully protecting the wells from surface wash; and by taking steps to have all cesspools within a distance of 500 feet of the wells made water-tight, and all privies within the same distance provided with metal containers, and to have the contents of such receptacles removed at proper intervals to some remote place for disposal.

SENECA FALLS

An investigation of the sanitary condition of the public water supply of the village of Seneca Falls, Seneca county, N. Y., was made by Mr. Henry Ryon, assistant engineer in this Department, on April 1 and 2, 1920, subsequent to an epidemic of gastroenteric disturbances which occurred during the several days following March 13, 1920.

Seneca Falls is a village of about 7,000 inhabitants located three miles west of the north or outlet end of Cayuga lake. The water supply of the village is derived from the lake and is treated in pressure mechanical filters before being delivered to the consumers. The average daily consumption is about 1,500,000 gallons and the average per capita consumption about 214 gallons. The waterworks are owned and operated by the Seneca Falls Water Company.

Cayuga Lake, the source of the water supply of the village, is about 37 miles long and from 1 to 3 miles across, the area of its water surface being about 65 square miles. The lake forms a part of the New York State Barge Canal system, and control gates have been installed at Mud Lock, on the outlet of the lake, by which its level may be varied to suit the requirements of the canal. The watershed of the lake has a total area of 863 square miles. The 797 square miles not including the water area is covered principally by farm lands, but has on it several municipalities, including Ithaca, Aurora, Cayuga, Dryden, Freeville, Newfield, Trumansburg, and Union Springs. The total population on the watershed is estimated at about 30,000.

At the north end of the lake the Seneca river, now a part of the New York State Barge Canal, discharges just above the outlet and control gates at Mud Lock. This river at the outlet of Cayuga Lake has a watershed of 730 square miles, including 86 square miles of water surface in Seneca and Keuka lakes. The character of the watershed is very similar to that of Cayuga Lake. The river, however, below the outlet of Seneca Lake receives the sewage of Geneva, Waterloo, and Seneca Falls. Normally the flow of water in Cayuga Lake is northward, and the polluted water of the Seneca river when it reaches the lake mixes with the lake water and flows north through the outlet. When the control gates at Mud Lock are closed or partially closed so that the flow from Cayuga Lake and the Seneca river is greater than the outflow through the gates at Mud Lock, the polluted water of the river backs up into the shallow north end of the lake for several miles and considerably past the intake of the waterworks. Information obtained from the engineer in charge of the operation of the locks in the vicinity, however, revealed the fact that the gates at Mud Lock had been closed most of the winter, and were opened on March 21 a few days prior to the inspection but subsequent to the outbreak of the epidemic of gastroenteric disturbances in Seneca Falls. On account of the ice no one was able to give, from personal observation, any information as to the direction of the currents in the lake during the month of March. It is certain, however, due to the fact that the gates at Mud Lock were closed and there was a heavy runoff, that the flow was in a southerly direction, or from the outlet toward the waterworks intake, for several days prior to the opening of the gates on March 21, 1920, and that the polluted water of the Seneca river reached the intake during that period.

The filter plant consists of four units, each 6 by 22 feet in size, giving a total area at the diameter of the cylinders of about 700 square feet, or 0.016 of an acre. The rate of filtration is approximately 94,000,000 gallons per acre per day. The loss of head through the filters varies from 2 to 7 feet. They are washed at intervals of about 38 hours, the process requiring approximately 15 minutes. After washing the filtered water is wasted for 10 minutes. Alum is used as a coagulant and is applied from a solution tank in the pump room that is connected to the main suction pipe. There is no coagulation basin. The alum is generally applied at a rate of from 0.1 to 0.6 grains per gallon, depending upon the quality of the raw water. No record of the turbidity of the raw water is available, but the thaws and rains about the 13th are known to have greatly increased the flow of the

streams at that time, and it is probable that the turbidity and amount of pollution of the lake at the waterworks intake reached its maximum shortly after, due largely to the fact that the increased runoff and the closed gates at Mud Lock undoubtedly caused the water of the polluted and then turbid Seneca river to flow southerly into the lake in large quantities. The quantity of chemical applied, however, was not increased until the 17th.

According to the statements of the health officer of the village and others, there were a large number of cases of gastroenteric disturbances in the village during the latter part of March. These cases could apparently be traced to no common cause except the water supply. The first cases appeared about the 15th of March, and the epidemic continued for a week, the number of cases gradually diminishing. On the 12th and 13th of the month, 2 days prior to the outbreak, there were heavy rains in the vicinity accompanied by a rise in temperature which melted considerable snow, and the runoff of the watershed was probably the largest of the year. During this period the gates at Mud Lock were closed, and although there is no evidence based on actual observation to support the fact, it is probable that in addition to the large inflow of surface drainage from the natural watershed of the lake, the water of the polluted Seneca river undoubtedly backed into the lake beyond the waterworks intake. There was at this time a noticeable increase in the turbidity of the lake water, and according to the statements of the engineer at the pumping station, a marked decrease in the alkalinity. Statements from the people of the village indicate that there was a slight increase in the turbility of the water supply, but that this was apparently not very marked. No figures were available to indicate quantitatively the change in the physical and chemical character of the water, and no bacteriological test had been made during this period from which information regarding the degree of pollution of the raw water could be obtained. The pollution was, however, undoubtedly quite serious, for the water of the Seneca river which flowed south to the waterworks intake was very turbid and polluted with sewage to such an extent that particles of floating sewage solids could be seen in it. The fact that the character of the raw water was materially changed and undoubtedly carried an unusual amount of polluting matter just prior to the outbreak of the gastroenteric disturbances, seems to indicate that the water supply was the cause of the outbreak. In connection with this it should also be noted that similar outbreaks of intestinal trouble have occurred in previous years, always following a change in the quality of the raw water.

As a result of this investigation it was recommended that suitable apparatus for the chlorination of the water supply of the village be immediately installed, and that liquid chlorine be applied to the water continually at all times in such proportion as may be found necessary and at a rate of not less than 0.2 parts per million; that the required rate of application of the chlorine to the water be determined daily by tests for excess chlorine in the treated water made at the filter plant, and that the chlorine be applied in such quantities as the tests indicate are necessary; that the condition of the raw water be carefully watched, and the quantity of coagulant applied be regulated in accordance with the results of daily tests, and that a coagulation basin having a capacity equal to not less than 2 hours flow be constructed and used in connection with the operation of the plant.

SHARON SPRINGS

A reinspection of the public water supply of the village of Sharon Springs was made by Mr. Earl Devendorf, assistant engineer in this Department, on October 8, 1920, a previous inspection of this supply having been made by this Division in 1915.

Sharon Springs is a village located in the northwestern corner of Schoharie county, on the Cherry Valley branch of the Delaware and Hudson railroad. The population is variable, being about 500 in winter and 3,500 during the summer months. The public water supply is owned by the village and operated under the direction of a water board.

The supply is mainly derived from a stream and small lake of approximately 60,000,000 gallons capacity, located some 4 miles southwest of the village. An intake pipe extends some 300 feet into the lake, through which the water flows by gravity to a reservoir located about ¼ of a mile below the lake. The reservoir has a capacity of about 3,000,000 gallons. The supply is also partially derived from 2 springs located about 1½ miles west of the reservoir and near the headwaters of the stream feeding the reservoir. From the reservoir the water flows by gravity through pressure mechanical filters, located near the village, to the distribution system in the village.

The lake from which the supply is derived is fed by a small stream draining a sparsely populated watershed of approximately 1 square mile in area. The slopes are steep and the larger part of the area is used for grazing and agricultural purposes. Several buildings are located near the stream. The north spring of the 2 from which the spring supply is derived is located in a ravine above all houses and is not directly subject to pollution. The spring basin is walled with stone sides on which a small wooden house is built provided with a wooden door. The south spring is located in a field below a farmhouse and undoubtedly receives some drainage from the farm.

The purification plant consists of 3 pressure mechanical filters of the International Filter Company type. The filters are 8 feet in diameter and 5 feet in height. Assuming a water consumption of 100 gallons per capita per day, the rate of filtration with all the filters in operation is 101,000,000 gallons per acre per day when the population reaches 3,500, the maximum during the summer months. Provision is made for applying alum by means of the shunt system, but at the time of the inspection alum was not being applied. It is the practice to discontinue the use of the filters between the months of November and May inclusive.

As a result of the reinspection it was concluded that the public water supply of Sharon Springs is in practically the same condition as that described in the former report made in 1915, and that the recommendations made in that report have not been carried out; that the officials in charge of the public water supply have employed an engineer to study the conditions for the purpose of eliminating the shortage of water among the residents living in the higher section of the village during the summer months when the hotels. located in the lower section of the village, are using large quantities of water; that while the filters were being operated at the time of the inspection, alum was not being used, and that it has been the practice to discontinue the operation of the filter plant between the months of November and May each year; that the results of the analyses of samples taken at the time of the inspection indicate that little or no purification was being obtained by the purification plant.

It was therefore recommended that the officials in charge of the public water supply carry out the recommendations made in the former report; that steps be taken to improve the distribution of the supply to the residents located in the higher sections of the village; that the officials in charge of the public water supply operate the plant in the future in such a manner as to secure a satisfactory purification of the water supply, using adequate amounts of alum at all times; and that the filter plant be operated during the winter months.

SHELTER ISLAND HEIGHTS

A reinspection of the public water supply of the village of Shelter Island Heights was made on June 7, 1920, by Mr. Alfred Mullikin, assistant engineer in this Department, a previous inspection of this supply having been made by this Division in 1915.

Shelter Island Heights is located in the northwestern part of Shelter Island. in the town of Southold, about ¾ of a mile south of the village of Greenport. The waterworks are owned and operated by the Shelter Island Heights Association.

The water supply is derived from three dug wells, Nos. 1, 2 and 3, each having a separate pumping station. The water is supplied to the consumers by pumping it through a distributing system consisting of approximately 6 miles of concrete lined steel pipe. The water from wells Nos. 1 and 3 is pumped into a low service system, the surplus going to an elevated wooden tank having a capacity of 20,000 gallons. The water from well No. 2 is pumped into a steel tank having a capacity of 54,000 gallons, which takes the surplus and acts as an equalizing reservoir. The water from the high pressure service is supplied to about 10 cottages.

As a result of the inspection of the public water supply of Shelter Island Heights, it was concluded that the authorities in charge of the water supply have in part carried out the previous recommendations of this Department; that there are no cesspools or privies or other visible permanent sources of pollution in the vicinity of the wells; that there remain certain opportunities for serious pollution of the water due to the fact that the ground around wells Nos. 1 and 2 is not fenced to prevent people from trespassing upon it, and by leakage from tile sewers in the vicinity.

It was therefore recommended that the association authorities in charge of the water supply maintain a careful sanitary patrol in the vicinity of the wells at all times; that the reserved areas at wells Nos. 1 and 2 be fenced to prevent trespassing, and the grade arranged to turn surface water which might enter either way from the wells; and that all sewers within a radius of 500 feet be relaid with castiron pipe and lead joints in order properly to protect the ground water from dangerous contamination.

SIDNEY

A reinspection of the public water supply of the village of Sidney was made on September 23, 1919, by Mr. Earl Devendorf, assistant engineer in this Department, previous inspections of this supply having been made by this Division in 1908, 1909, and 1913.

Sidney is a village located in the northeastern part of Delaware county, on the Susquehanna river. The resident population is about 3,000, nearly all of whom are served by the public water supply. The waterworks were owned and operated by the Sidney Water Works Company at the time of the inspection but were to be transferred to the city. The supply is derived by gravity from impounding reservoirs on Collar brook and Peckham brook. The Collar brook supply consists of four impounding and storage reservoirs located one above the other in a rocky ravine. In the bottom of the second lowest reservoir there is a sand and gravel strainer. There are also two crude open gravity mechanical filters located in the bottom of the lowest reservoir, from which the water is led into the distribution system. The capacities of the reservoirs, starting with the lowest, are respectively 288,000, 4,398,000, 4,819,000 and 13,424,000 gallons, making a total storage of approximately 23,000,000 gallons on this watershed. The total drainage area tributary to the reservoirs on Collar brook is about 1.6 square miles, consisting largely of farm land and woods. Farm houses are located well back from the brook, with the exception of a vacant one owned by the water company.

The supply derived from Peckham brook is stored in an impounding reservoir, and is filtered through two gravity mechanical filters located at a point about 2½ miles northwest of the village. This reservoir has an estimated capacity of 43,000,000 gallons. The filters, located midway at the dam in an arched masonry chamber, are said to consist of ungraded sand and gravel over which is approximately 22 feet of water. The area of the watershed above the Peckham reservoir is approximately 5 square miles, and consists largely of farm and pasture land with a considerable percentage of wooded land. Several sources of contamination exist on the watershed. It is estimated that approximately two-thirds of the water supplied to the village is derived from the Peckham brook supply.

As a result of the reinspection it was recommended that the village authorities in charge of the water supply carry out our former recommendations as soon as possible; that ice cutting on the reservoir be discontinued; that as previously recommended the existing sources of pollution on the watershed be removed, and if any difficulty be experienced in this matter, application be made to this Department for the enactment of rules and regulations for the sanitary protection of the water supply; that the present filters be abandoned and a modern filtration plant be installed; that in the meantime, pending these improvements, the supply be sterilized by the application of liquid chlorine; and that in view of the complicity of this problem, the village employ a competent consulting engineer to study the matter and prepare plans for the proper improvements of the supply.

SODUS POINT

An inspection of the water supply of Sodus Point was made by Mr. Earl Devendorf, assistant engineer in this Department, on May 28, 1920.

Sodus Point is an unincorporated village of about 500 inhabitants located in the northern part of Wayne county, some 15 miles north of Newark, on the shore of Lake Ontario. The village is not furnished with a public water supply, being served by private wells; neither is there any public sewer system, the inhabitants using cesspools and privies.

The water supply is obtained from two wells known as Main's well and the Lake Shore well. The Main's well is a dug well 22 feet in depth and had about 8 feet of water in it at the time of the inspection. The well is provided with a chain pump for drawing the water. A concrete curb and cap prevents surface wash from entering the well directly. The nearest possible source of pollution is a privy located in the rear of the houses at a distance of 50 feet from the well and at an elevation of approximately 5 feet below the ground surface near the well. The Lake Shore well is located approximately 300 feet from the shore of Sodus bay, at an elevation of about 15 feet above the water surface in the bay. The privy used at the Harris house is located south of and above the well at a distance of approximately 100 feet from it. This well is a drilled one, and is said to be 160 feet in depth. The ground surrounding the well is properly graded and a concrete platform provided so that there is no opportunity for surface wash to enter the well directly. The water is lifted from the well by means of a deep well pump.

As a result of the inspection it was recommended that the privies near Main's well and the Lake Shore well either be removed to a point at least 100 feet away from and below the wells, or suitable removable containers be provided and properly maintained in order that the excreta may be satisfactorily removed and disposed of by burial at a point where it will not pollute the ground water supplying the wells; that frequent analyses be made of the water of these wells in order that any breaking down in the natural purification afforded by filtration through the soil may be immediately detected, and should any evidence of such a failure be noticed, steps be immediately taken to treat the water by suitable means, or if possible to remove the source of pollution, and that the authorities in charge exercise due care and precaution to prevent any possible pollution from entering the well supply.

SONYEA (Craig Colony for Epileptics)

Plans for additions to the water supply system of the Craig Colony for Epileptics at Sonyea, consisting of architect's drawing No. 2026, were submitted to this Department for approval on June 10, 1920. The plans provided for excavation and improvements of an existing pond to be used as a storage reservoir, and certain pipe lines and appurtenances connected with

the reservoir. After careful consideration by the Engineering Division the plans were approved on July 16, 1920. On July 24, 1920, amended plans, making certain minor changes in the pipe lines and appurtenances connected with the reservoir, were submitted to this Department for approval, and approved on July 27, 1920.

SOUTHAMPTON

A reinspection of the public water supply of the village of Southampton was made on June 5, 1920, by Mr. Alfred Mullikin, assistant engineer in this Department, a previous inspection of this supply having been made by this Division in 1916.

Southampton is located in the town of Southampton, about 91 miles from New York city. The village proper is a residential district with a population varying from 2,500 in the winter to 5,000 during the summer. The waterworks are owned and operated by the Southampton Water Works Company.

The water supply is derived from 5 driven wells about 85 feet deep, located some 1,500 feet north of the railroad depot, or about 1⅛ miles north of the central part of the village. From the wells the water is pumped into steel storage tanks under air pressure which forces the water through a distributing system consisting of about 30 miles of castiron pipe.

The area owned by the water company is about 45 acres, of which 20 acres have been reserved for the protection of the water supply. A part of this area has been planted with small pine trees. There are no houses located on this area, the immediate vicinity also being sparsely settled. The nearest house is more than 500 feet distant from the wells. The toilet for the pumping station is provided with a metal container, and the contents are disposed of by burying in the ground some 50 feet east of the plant.

As a result of the reinspection it was recommended that the authorities in charge of the water supply maintain a careful sanitary patrol in the vicinity of the wells to discover and eliminate all possible sources of pollution, and that the contents of the container of the pumping station toilet be removed to and disposed of by burial at a place not less than 500 feet distant from the wells.

SOUTH NEW BERLIN

A reinspection of the public water supply of the village of South New Berlin, Chenango county, N. Y., was made by Mr. N. H. Baier, sanitary inspector in this Department, on November 24, 1920, a previous inspection of the supply having been made by this Division in the year 1917.

South New Berlin is located in the towns of New Berlin, Morris, and Butternuts, about 40 miles south of Utica. The present population is 350, of which 93 per cent is served by the public water supply. The waterworks are owned by the South New Berlin Water Company.

The water is derived from springs which flow into two catchbasins located about ½ mile east of the village. From these basins the water flows by gravity to a covered masonry reservoir of 100,000 gallons capacity. This reservoir takes the surplus from the Owens springs and all the water from the Grover springs, and acts as an equalizing reservoir. The water is delivered by gravity through a distributing system. The watershed of the springs consists of pasture and forest land which is hilly and of a gravelly subsoil. The Owens springs appear to be well protected from surface wash. The Grover springs, however, while concreted and banked to prevent the entrance of surface wash, are located where pollution from pasture land may enter the springs by intermittent filtration through the gravelly soil.

For an auxiliary supply, two 6-inch wells of 265 feet depth have been used, one owned by the Water company, the other by the Nestles Food Company, formerly the Borden's Condensed Milk Company. The wells are within a

short distance of each other and located near the fairly well built-up section of the village.

As a result of the reinspection it was recommended that the authorities in charge of the water supply enclose a sufficient area about each of the Grover springs adequately to protect them from pollution; that the walls of the Grover springs catch-basin be raised to prevent the entrance of surface wash; and that a more substantial roof covering, similar to that at the Owens springs catch-basin, be constructed to prevent the entrance of accidental or willful pollution into the basin; that if after all possible precautions have been taken to safeguard the supply of the Grover springs from pollution the supply is still found to be unsatisfactory, then a new source of supply be sought; and that a rigid sanitary patrol of the land around the springs be maintained.

SPRING VALLEY

A reinspection of the public water supply of Spring Valley, was made by Mr. W. J. Erickson, engineering assistant in this Department, on June 18, 1920, a previous investigation of this supply having been made in 1916.

Spring Valley, which a village of about 3,000 population, is in the southern part of Rockland county. The water supply is owned and operated by the Spring Valley Water Works and Supply Company.

The supply is derived by pumping from two wells located in the northern part of the village. From these wells the water is pumped into the storage reservoir and from there to the distribution system consisting of 10 miles of water mains in Spring Valley and 25 miles in the districts outside the village, ranging from 4 to 20 inches in diameter. The consumption in the village is about 166,000 gallons daily, and that of the outer districts about twice as much.

The two wells from which the supply is obtained are located about 100 feet from the pumping station, near the road and a few feet from a small stream. These wells are 8 inches in diameter and driven to a depth of about 400 feet. For the first 30 feet they pass through sand, gravel, and clay, and for the remaining distance through rock (Newark sandstone). The wells are cased to a distance of about 6 feet into the rock. The suction lines are connected with the wells at points about 12 feet below the surface of the ground. Nine wells have been driven but only the two referred to are being used.

The storage reservoir is located on a low hill about 300 feet from the pumping plant and wells. It is 175 by 250 feet in plan and 16 feet deep. Pressure is maintained by a standpipe located about half a mile east of the pumping station. This standpipe is 20 feet in diameter and 100 feet high, with a capacity of about 235,000 gallons. Generally the water from the standpipe supplies Spring Valley only, and the supply for the outer districts is taken from the reservoir.

The watershed of the stream flowing by the wells is approximately 2.6 square miles, on which there are about 50 houses, with a total population which may be estimated at 250, or about 96 per square mile. It seems probable that, although the stream receives a moderate amount of pollution from surface wash of this populated area, the possibility of polluting the wells is remote, except by percolation through crevices in the rock or along the outside of the well casings. Furthermore, the location of the wells on the outskirts of a village unprovided with public sewers does not assure that the well supply will continue to be free from pollution in view of the presence of many leaching cesspools and privies within the zone of possible influence. The natural drainage in the village is, however, away from the wells.

It was therefore recommended that the waterworks company continue to maintain a system for the collection and analysis of samples of water from the supply in order to detect the presence of any active contamination which may at any time occur; that in case such analyses indicate the occurrence

of active contamination the waterworks company take immediate steps to determine and eliminate the cause and source of such contamination; and that in case it is found impossible or impracticable to eliminate completely the cause and source of such contamination, the waterworks company consider the installation of suitable apparatus for sterilization of the supply with liquid chlorine.

STAATSBURG

A reinspection of the public water supply of the village of Staatsburg, Dutchess county, N. Y., was made on October 26, 1920, by Mr. N. H. Baier, sanitary inspector in this Department, a previous inspection of this supply having been made by this Division in 1915.

Staatsburg is located in the northwestern part of the town of Hyde Park, 11 miles north of the city of Poughkeepsie. The present population is 600, of which 75 per cent is served with water from the public supply. The waterworks are owned and operated by the Staatsburg Water Company.

The water supply is derived from a small stream which was impounded at a point about a mile east of the village. The reservoir thus formed is located about ¾ of a mile south of the origin of the stream. It has a capacity of approximately 30,000,000 gallons, which is equivalent to a three years' supply. At the time of the inspection the water was clear, although there was considerable growth of vegetation at a number of places in the reservoir. Copper sulphate is applied twice a year to prevent algae growth. The water from the reservoir passes to two covered filter beds of the slow sand type, each 18 by 60 feet in plan, containing about 2½ feet of sand supported on gravel. The combined area of the two beds is 0.05 of an acre, and the average rate of filtration about 600,000 gallons per acre per day.

As a result of the reinspection of the public water supply of Staatsburg it was concluded that the filtered water was of a satisfactory sanitary quality, although it contained considerable color and odor which can only be removed by special processes; that the raw water contained some active contamination and was highly colored, probably due to the large percentage of swamp land and the growth of vegetation in the reservoir; and that due to the low position of the intake, water containing an unnecessary amount of decayed vegetation is carried to the filter.

It was therefore recommended that the authorities in charge of the water supply continue to maintain a careful sanitary patrol of the watershed and operate the plant in an effective manner; that the reservoir be cleaned of its vegetation whenever necessary, and that copper sulphate be applied to the water in proper proportions at regular intervals to prevent the growth of algae and other microscopic organisms; that the present intake pipe at the reservoir be re-located so that water will be taken at a point nearer the surface of the water, preferably at a point 4 feet from the surface; and that the authorities consider the installation of an aeration plant to remove the odor from the water, and the draining of the swamp or the making of certain changes in the plant to eliminate the color.

STILLWATER (Public School)

An investigation of the water supply of the public school at Stillwater, Saratoga county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on October 29, 1920. The results of the inspection indicated that the existing well at the schoolhouse was subject to pollution from surface wash, waste water from the pump, pollution of the ground in the vicinity by those passing over it, and by seepage from several privies.

It was accordingly recommended that a new or additional source of water supply of safe quality and adequate quantity be obtained, either by increasing the depth of the present well or by the drilling of another well, or by such other means as may be found to be most practicable.

SUFFERN

A reinspection of the public water supply of the village of Suffern was made by Mr. Henry Ryon, assistant engineer in this Department, on June 9, 1920, previous inspections of the supply having been made in 1909, 1915, and 1916.

The village of Suffern is located in the western part of Rockland county, on the Erie railroad, 32 miles from New York. The population is about 3,000, all of whom are served with water from the public supply. The water for the public supply is taken from Antrim lake, on the Mahwah river, and chlorinated and filtered before being delivered to the consumers. The total water consumption is estimated at 175,000 gallons per day, or about 58 gallons per capita per day. The supply is owned by the municipality and is under control of a board of water commissioners. On account of the unsatisfactory conditions on the watershed, which have been described in previous reports, the village authorities are, at the present time, considering the development of a new source of supply.

To this end they have drilled a well on the waterworks property between the pumping station and the Mahwah river. This new well is said to be 340 feet deep. It is 10 inches in diameter for the first 65 feet and 8 inches in diameter for the remainder of the distance. The well is cased to rock, a distance of about 75 feet. According to the records kept by the board of water commissioners, the well passes through 25 feet of dry gravel, 20 feet of wet gravel, 20 feet of quicksand, 5 feet of rock (probably a boulder), 5 feet of wet gravel, and 265 feet of what is locally known as red rock (Newark sandstone). The well is located about 25 feet west of the west bank of the Mahwah river, and about 100 feet north of the Piermont branch of the Erie railroad. The surface of the ground at the well is 8 or 10 feet above the water elevation in the lake. The water in the well stands at approximately 12 feet below the elevation of the surface of the ground adjacent to it. The well has been tested by pumping for short periods, and the result of the last test, said to have extended over 84 consecutive hours, indicated that with the pump cylinder at a depth of 63 feet the well could deliver about 160 gallons per minute. There is some doubt, however, as to whether or not this rate can be maintained in the continuous operation of the plant.

The Newark sandstone, from which the water of the wells is apparently derived, underlies the larger part of Rockland county and extends southward into New Jersey, Pennsylvania, and Maryland. In New York State it extends from the Hudson river to the Ramapo mountains, stopping abruptly at the granite rocks forming those hills. Along the Hudson river and at Ladentown and Suffern, trap rock has been forced up through the sandstone. The sandstone is covered at most places with a layer of glacial drift, thicker in the valley than on the hills, composed of sand, clay, gravel and boulders. Judging from outcrops and places where the rock is exposed in cuts, the sandstone varies considerably in structure and composition. Some strata are of comparatively fine compact sandstone, and others are a coarse conglomerate containing a large percentage of quartz and limestone, pebbles and boulders, some 10 and 12 feet in diameter. Many of the layers are hard and almost impervious, while others are porous and so soft as to be easily crushed by the fingers. Where the rock is exposed it is generally creviced. In general, the dip of the strata is toward the west, the inclination in most cases being about 10 degrees. Just east of the new well and on the opposite side of the Mahwah river, a mass of trap rock known as Union hill has been forced up through the sandstone, and consequently the strata in the vicinity considerably disturbed. About ¼ of a mile west of the well the sandstone ends abruptly in a fault of unknown extent at the foot of the granite rock of the Ramapo mountains.

At Spring Valley, about 7 miles east of Suffern, the water supply of the Spring Valley Water Company is taken from wells in the Newark sandstone about 200 feet deep. The supply seems to be abundant. The hardness of the water averages about 70, and the chlorine content about 4. The bacteriological counts are generally high, and organisms of the B. coli type have once or twice been found in 10 c.c. inoculations.

A well said to be over 200 feet deep has been drilled on Union hill about ¼ of a mile east of the well and 100 feet above it. This well yields considerable water although there is no accurate record of its actual capacity. The water in the well is said to stand at a level of about 12 feet below the surface of the ground when the pump is not operating, which would seem to indicate that the water is probably of local origin and that there is not any direct connection between the rock at the surface and the rock from which the new village well receives its supply.

It seems probable, therefore, that if carefully developed the new well may yield a water of satisfactory sanitary quality. There are, however, apparently two ways in which the water of the well might become polluted: By leakage of surface water into the well where the casing joins the rock, or by polluting matter near the well or at a considerable distance reaching its water through the crevices in the rock; for as stated above, the strata in the vicinity of Suffern has been considerably disturbed and an examination of the outcrops and exposed places seems to indicate that the rock is badly creviced. If this well or other wells in the vicinity are developed as a source of water supply for the village, great care should be taken to make the connection between the well casing and the rock watertight, and the water should be constantly watched for indications of pollution. If such pollution is found and cannot be prevented, it will of course be necessary to chlorinate the water.

As a result of the reinspection it was recommended that the village authorities strictly enforce the rules and regulations for the protection from contamination of the water supply of the village, and construct sewers around the north shore of Antrim lake in accordance with the plans approved by this Department, or develop a new source of supply without delay; that the purification plant be carefuly operated at all times; and that if a new supply is developed by drilling wells in the vicinity of the present pumping station, the village acquire control of as much land as possible near the wells in order to be able to prevent its pollution; and enclose the area immediately adjacent to the supply by a fence and prohibit trespassing upon it.

SUMMITVILLE

An inspection of the water supply of the New York, Ontario and Western Railway Company at Summitville was made by Mr. W. J. Erickson, engineering inspector in this Department, on May 13, 1920.

Summitville is an unincorporated village in Sullivan county, about 33 miles southwest of Kingston, at the junction of the main line and the Monticello, Port Jervis and Kingston division of the New York, Ontario and Western railroad.

The supply, which is derived from a small mountain stream about 2 miles from the station, supplies the station, the hotel, and occasionally water tanks in the passenger coaches. It is developed by damming a small mountain stream flowing through a narrow rocky ravine. The dam forms a reservoir about 15 feet wide and 200 feet long. The watershed, which has an area of about ¾ of a square mile, is very steep and covered with underbrush and timber. A road passes parallel to the stream and crosses it in the upper section of the watershed. Only 1 house is located on the watershed: This is near the divide, and about ⅛ of a mile from the stream tributary to the reservoir.

At the time of the inspection samples were taken from the reservoir and from a tap in the station and sent to the Division of Laboratories and Research for analyses. These analyses show a water that is clear, colorless, and very soft. The figures for ammonia compounds and oxygen consumed were low, denoting small amounts only of organic matter. The chlorine content was higher than that for unpolluted water of this section. The total

bacterial counts vary, being very high in the sample collected on May 13. Organisms of the B. coli type were present in all of the 10 c.c. inoculations tested, and in a third of the 1 c.c. inoculations, denoting considerable active contamination.

As a result of the inspection it was recommended that the present supply be abandoned as a source of drinking water and another supply of satisfactory sanitary quality be developed.

The water of this supply is used by the New York, Ontario and Western railroad for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on November 10, 1920, and included, in addition to the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were not entirely satisfactory, and that the results of the inspection and the analyses of the samples indicate that the water cannot be considered to be of an entirely satisfactory quality for human consumption. A copy of the report accompanied this data.

TANNERSVILLE

A reinspection of the public water supply of the village of Tannersville was made by Mr. A. I. Howd, assistant engineer in this Department, on October 13, 1920, a previous inspection of this supply having been made by this Division in 1916.

The village of Tannersville has a summer population estimated at 5,000, but during the remainder of the year the population is only 758 according to the census of 1915. It is located in the southeastern part of Greene county, on the Kaaterskill branch of the Ulster and Delaware railroad. The waterworks are owned and operated by the Tannersville Water Company.

The water supply is derived from a small spring brook about 2 miles northwest of the village. A dam constructed across the brook forms a small impounding reservoir from which the water flows by gravity to the village. An auxiliary supply is derived from Schoharie creek, about 2 miles south of the village.

The watershed from which the regular supply is derived is about 1 square mile in area and has a population of about 15 persons. The buildings are well removed from the reservoir and tributary streams. The shed is located on the side of a mountain and most of it is wooded. Golf grounds of a private club at Onteora Park are located on the watershed. There seems to be no direct source of pollution of the supply, but the watershed and reservoir are always subject to accidental or willful contamination by visitors on the watershed.

As a result of the reinspection it was again recommended that the water supply be sterilized with liquid chlorine during the summer when the supply is subject to pollution by visitors on the watershed; that the auxiliary supply derived from Schoharie creek be sterilized with liquid chlorine when it is necessary to use this supply; and that the authorities in charge of the water supply make frequent inspections of the watershed with a view to maintaining it in as sanitary a condition as possible at all times.

THENDARA (Fulton Chain)

An inspection of the public water supply of the village of Thendara (Fulton Chain) was made by Mr. Earl Devendorf, assistant engineer in this Department, on May 25, 1920.

Thendara is an unincorporated village located in the central part of Herkimer county, about 40 miles north of Utica. The population at the time of the inspection was estimated at 400, practically all of whom are furnished with water from the public supply. The water supply is owned by

Mr. Lyon DeCamp. The supply is derived from springs located on a hill ¾ of a mile west of the New York Central railroad station. A 4-inch pipe leads the water from the small intake to the village. The watershed is uninhabited. It has been burned over and at present is covered with berry bushes and second growth timber. No storage is provided. There are approximately 2 miles of water mains ranging from 1 inch to 4 inches in diameter.

As a result of the reinspection it was concluded that the water supply of Thendara as developed is of fairly satisfactory sanitary quality for an unpurified surface supply, although as is true of all surface water supplies, it is subject to direct contamination of either accidental or willful nature from hunters or trespassers on the watershed, and that the supply is depleted during periods of cold weather when the inhabitants allow the faucets to remain open to prevent freezing.

It was therefore recommended that the authorities continue a careful patrol of the watershed to prevent any contamination of the public water supply.

The water of this supply is used by the New York Central Railroad for drinking and culinary purposes in interstate traffic. Data regarding the supply were furnished to the United States Public Health Service on October 22, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions surrounding the supply were fairly satisfactory, and that the results of the inspection and the analyses of the samples, together with the results of previous inspections and analyses, indicate that the water was of satisfactory quality for human consumption. A copy of the report accompanied this data.

THIELLS (Letchworth Village)

Plans for proposed extensions to the water system to serve the girls' group at Letchworth Village, Thiells, Rockland county, N. Y., consisting of architect's drawing No. 2244, were submitted by the State Architect to this Department for approval on May 14, 1920, and after careful consideration by the Engineering Division were approved on May 20, 1920. Revised plans making minor changes in the arrangement of the piping were submitted for approval on July 21, 1920, and approved on July 27, 1920.

THOMPSON (School)

An inspection of the water supply of District School No. 10, at Thompson, Washington county, N. Y., was made by Mr. W. J. Erickson, engineering assistant in this Department, on December 2, 1919.

As a result of the inspection it was recommended that the school authorities obtain a new source of supply so located as to be free from all possible sources of contamination, or if this is not feasible, protect the present source of supply by repairing the lining of the well, providing a tight cover, fencing the area around it to prevent trespassing, arranging the level of the ground above flood water, and removing the school cesspools as far as possible from the well.

TONAWANDA

Inspections of the public water supply of the city of Tonawanda were made by representatives of this Division on January 21, 1920, March 17, 1920, and October 19, 1920. Special attention was given to the chlorination of the water at these times, on account of the fact that there had been several cases of typhoid in the city due to the failure of the chlorination apparatus during the previous year.

VALATIE (Farm Colony)

An investigation of the water supply of the Farm Colony of the Rome State School for Mental Defectives at Valatie, Rensselaer county, N. Y., was made by Mr. Henry Ryon, assistant engineer in this Department, on August 25, 1920.

The main water supply of the institution is derived from a 6-inch drilled well about 60 feet deep, located 200 feet south of the more southerly of the 2 buildings of the institution. There seemed to be little chance of pollution reaching this well except by the entrance of water from the floor of the pump house. The cottage is supplied from a spring in a small ravine just east of the building, located immediately below the chicken-yard and hog-yard and also below the cesspool serving the cottage.

As a result of the inspection it was recommended that to supply the immediate needs of the institution the present well be operated for a longer period each day, either by keeping an attendant at the pump house or by equipping the pump with an automatic controlling device; that provided it is not intended to increase materially the population of the institution, an additional well be constructed on the plain near the buildings, and connected to the system of the institution; that the floor of the pump house be so arranged that it will be impossible for water falling on it to flow into the well; and that a new source of supply of unquestioned sanitary quality be developed at the cottage.

VALLEY JUNCTION

An inspection of the public water supply of the depot of the New York, Ontario and Western railroad at Valley Junction was made by Mr. W. J. Erickson, engineering assistant, on May 14, 1920.

Valley Junction is located on the Neversink river, in the western part of Orange county, about 8 miles northeast of Port Jervis.

The water used for the wash basins and flushing the public toilets and by the station master's family in the depot is derived from a deep well located in the corner of the cellar under the baggage room. The well is said to be about 300 feet deep drilled mostly through gravel. There is a 16-inch tile casing which is said to extend to the bottom of the well, inside of which is a 2-inch suction pipe which is also said to extend to the bottom of the well. The top of the casing is about 2 feet above the cement floor of the cellar and is apparently tight so that none of the overflow goes back into the well. The water is pumped into a pressure tank by a hand pump. There is a drain for the cellar about 10 feet from the well. This part of the cellar was used for no purpose other than housing the pump, and was clean at the time of the inspection.

The sewer pipe which conducts the wastes from the dwelling and toilets passes 25 feet from the cellar wall, or about 35 feet from the well, to a cesspool which is approximately 100 feet from the well, at about the same elevation as the top of it. This is the only source of possible pollution within half a mile of the well.

The well is about a quarter of a mile from the Neversink river, which at this point has a watershed of over 500 square miles. The watershed directly tributary to the well is about 4 square miles. There are about 7 dwellings on it, housing about 30 people, making the population approximately 7 persons per square mile.

It was recommended that the present well be abandoned and another constructed at such a location as to be free from possible contamination, or the present sewer and cesspool be re-located and reconstructed.

The water of this supply is used by the New York, Ontario and Western railroad for drinking and culinary purposes. Data regarding the supply were furnished to the United States Public Health Service on October 19, 1920, and included, in addition to the results of the analysis of a sample of the water, the statement that at the time of the inspection the conditions

surrounding the supply were not entirely satisfactory, and that the results of the inspection and the analyses of the samples indicate that the supply cannot be considered to be of satisfactory quality until the present well is abandoned and another constructed at such a location as to be free from possible contamination, or the present sewer and cesspool be re-located and reconstructed in accordance with our recommendations. A copy of the report accompanied this data.

WAPPINGERS FALLS

A reinspection of the public water supply of the village of Wappingers Falls was made by Mr. Earl Devendorf, assistant engineer in this Department, on November 5, 1919, a previous inspection of this supply having been made by this Division in 1918.

Wappingers Falls, a village with a population of about 4,000, is located in the southwestern part of Dutchess county, 8 miles south of Poughkeepsie and 1½ miles east of the Hudson river. The pumping station and filtration plant are owned by the Garner Print Works, and the distribution system and standpipe are owned by the village. At the end of a certain period, by the payment of amortization charges, the village will own the entire plant.

The water supply is derived from Wappingers creek, the intake being from a large penstock which leads from a millpond in the northeastern part of the village to the hydraulic power equipment of the Print Works. From the intake the water is passed through a coagulating tank, two filter beds, and a clear water well, from which, after chlorination with about 0.24 parts per million gallons, it is pumped through the distribution system. The average daily water consumption is approximately 200,000 gallons daily, or about 100 gallons per capita.

The watershed tributary to the intake is about 200 square miles in area, and consists of a moderately well populated farming district with a resident population of about 10,000, or 50 per square mile. There are 2 incorporated villages located on the watershed, neither of which has a public water supply or sewerage system. Opportunities for indirect pollution of the water supply streams by surface wash from the vicinity of farm houses, barns, highways, railroads, and cultivated fields are fairly numerous.

As a result of the reinspection it was concluded that the officials in charge of the water supply have in part carried out the recommendations in our previous report, and that the purification plant was being operated in a satisfactory and efficient manner at the time of the inspection; and that the existence of cross connections between the fire system at the Print Works and the village distribution system provides opportunity for contaminated water to enter the village mains at times of test on the fire pump or during fires. Furthermore, the possible introduction of raw water into the distribution system within the mill affords opportunity for careless or ignorant use of this water, when contaminated by raw water from the fire pump, for drinking purposes by the employees of the mill.

It was therefore recommended that the officials in charge of the water supply continue to maintain careful and efficient supervision of the operation of the purification plant in order that the supply may be at all times of a satisfactory physical and sanitary quality; that the village authorities apply to this Department for the enactment of rules and regulations for the sanitary protection of the watershed tributary to this supply; and that the auxiliary raw water supply at the Print Works be connected with the fire system of hydrants and sprinklers only, and that the remaining distribution system within the mill be supplied with purified village water only. Should it be necessary to cross the village system with the mill fire system, double check valves of an approved type and properly installed should be provided for such cross connections.

WASSAIC

A reinspection of the public water supply of Wassaic was made by Mr. W. J. Erickson, engineering assistant in this Department, on May 27, 1920, a previous inspection having been made in 1915.

Wassaic, which is an unincorporated village of about 200 inhabitants, is located in the town of Amenia, in the eastern part of Dutchess county. The water supply is owned and controlled by the Wassaic Water Company. About 70 use this supply.

The water supply is derived from two springs located about a mile north of the village. The water flows by gravity directly into the distribution system and to the storage reservoir. The distribution system consists of about a mile and a half of 2- to 3-inch wrought-iron pipe, on which there are 18 service taps, none of which are metered. A well is located near the center of the village from which an auxiliary supply is obtained.

The springs from which the supply is obtained are located on the slope of a hill. Immediately above the springs the water apparently flows underground for about 400 feet, while above this it seems to flow above ground after issuing from the rocks of the mountain higher up. The area through which the water flows over the ground is about 3 acres in extent, and is fenced so as to prevent trespassing. The source of the springs is probably in a shale or shist formation with considerable limestone. In times of drought the spring fails. The water is collected in two basins 3 feet square about 15 feet apart. They are built of stone masonry and have flat wooden covers. From the springs the water is piped to the village through a 2-inch pipe.

The reservoir is located on the hillside about half way between the village and the springs. It is constructed of concrete and is covered with a wooden roof. The reservoir is said to be cleaned and the mains flushed out about once a year.

An auxiliary supply is obtained from a dug well located about 25 feet from the Ten Mile river and about 500 feet from the Wassaic creek. The well has been excavated to a depth of 4 feet, below which 6 feet of 10-inch tile has been sunk. It was found impractical to sink the well farther because the water entered it faster than it could be pumped out, due apparently to the rapid infiltration of the creek water through the coarse sand and gravel.

The area above the springs from which they probably derive their water is about half a square mile in extent. There are no houses on it and the only pollution is from the cattle pasturing above them. The springs are practically dry at certain seasons of the year.

The extent of the watershed tributary to the well is of course difficult to determine. However, the area between the streams and in which the well is located is practically flat. The village east of Ten Mile river is located on a hill and at a higher elevation than that of the well. On the flat area there are about 9 houses from 300 to 400 feet from the well, and about 15 houses within 500 feet from it. About 20 feet southwest of the well is a barnyard in which a manure pile was stored. About 50 feet north of the well is an empty pig-pen. It was stated that this pen has not been in use for some time. The nearest privy is about 125 feet west of the well, and there are privies and cesspools for practically all the houses in the village. Their condition is such that they undoubtedly pollute the ground in the vicinity, which pollution may reach the well. The watershed of the Ten Mile river which flows near the well is about 12 square miles in area. The stream undoubtedly receives some pollution above the well in passing through the village, and since the ground is very porous there is a chance that when the well is drawn down some of this polluting matter may reach the well.

It was recommended in the report dated September 10, 1920, that the water company permanently discontinue the use of the well supply, or remove as far as possible the unsatisfactory conditions immediately surrounding the well, and provide effective filtration or sterilization of the supply; that the fence around the spring be extended; and that the company endeavor to increase the supply by further developing the springs or obtaining water from a new source so as to make the use of the well water unnecessary.

WATERLOO MEMORIAL HOSPITAL

An inspection of the proposed water supply for the Waterloo Memorial Hospital, in the village of Waterloo, Seneca county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on July 17, 1920.

As a result of the inspection it was found that the dug well near the hospital, which the authorities in charge of the hospital contemplated using as a source of water supply in preference to the village supply, would probably yield a water of satisfactory sanitary quality, but was subject to possible pollution from surface wash and possible contamination from a tile sewer. It was accordingly recommended, that should the water from the dug well be used for patients in the hospital, a sample of the water be sent to the Division of Laboratories and Research for analysis; and that should active contamination be found, the authorities immediately return them and eliminate if possible the source of pollution, and if this cannot be done, obtain water from some other source.

WELLSVILLE

A reinspection of the public water supply of the village of Wellsville was made by Mr. E. S. Chase, assistant engineer in this Department, on March 19, 1920, previous inspections of the supply having been made by this Division in 1917 and 1918.

Wellsville is an incorporated village located in the southern part of Allegany county, on the Erie railroad, 27 miles west of the city of Hornell. The present population is estimated at approximately 5,500, of which practically all are served with the public water supply. The waterworks are owned and operated by the village under the direction of a board of water and light commissioners.

The supply is derived from the Genesee river, the intake being located about ½ mile south of the village. The river water is pumped to a 3,000,000 gallon raw water reservoir on a hill in the northern part of the village, and then flows by gravity through three units of slow sand filters located adjacent to the reservoir into a 500,000 gallon clear water basin, from whence it is distributed by gravity to the village. The average water consumption during 1919 was 577,000 gallons daily. The waterworks system and purification plant remain practically the same as described in detail in these previous reports.

From the inspection and the facts obtained thereupon it appears that there are certain faults which should be corrected. The intake should be so protected that its silting up will be avoided in the future; the direct connection between the old Worthington pumps and the distribution system should be broken; the chlorination plant at the pumping station should be kept in service continuously; the outlet from the raw water reservoir should be provided with an extension above the bottom of the reservoir so as to obtain the benefits of sedimentation therein; and the filter beds should be overhauled and re-sanded. Consideration should also be given to the construction of another unit of filters, and the filters should be covered with a layer of earth and sod to prevent freezing. At the earliest possible time the dirty sand in the filters should be removed and replaced by clean sand. An automatically controlled chlorination apparatus should be installed for chlorinating the filtered water, and should be in operation continuously. Heat should be provided for the building in which this apparatus would be housed. Furthermore, in view of the various difficulties which have been experienced in the operation of the waterworks system, a competent consulting engineer should be retained to go over the system in order to advise the village as to the best means of placing the works in a proper condition.

WESTBURY

A reinspection of the public water supply furnished by the unincorporated village of Westbury to Westbury, Wheatley Hills, Old Westbury, and Carle Place, Nassau county, N. Y., was made by Mr. Alfred Mullikin, assistant engineer in this Department, on May 28, 1920, a previous inspection of this supply having been made by the Division in 1915.

Westbury is located in the southwestern part of the town of North Hempstead, on the main line of the Long Island railroad, about 24 miles from New York city. The present population is estimated at 5,000. Of the total population, 40 per cent are served with water from the public water supply. The waterworks are owned and operated by the municipality and controlled by the village board of water commissioners.

The water supply is derived from 4 driven wells, 506, 360, 224, and 228 feet deep, located in the western part of the village some 2,000 feet northwest of the railroad depot at Winthrop street and Hicks lane. The two deeper and older wells are now used only in case of emergency. The water is obtained by air lifts and flows into a receiving well. From this receiving well it is delivered by pumping into a distribution system consisting of some 6 miles of castiron pipe. The daily water consumption in the summer amounts to approximately 300,000 gallons per day or 150 gallons per capita, while in winter the consumption amounts to approximately 250,000 gallons per day or 125 gallons per capita.

No specific sources of contamination were noticed in the vicinity of the pumping plant. The area of land reserved by the municipality for the pumping station measures approximately 100 feet by 300 feet. There are 15 or more houses located within a distance of 500 feet, and one privy about 75 feet northeast of the new wells. The houses are provided with cesspools and privies, there being no sewerage system in the village. The toilet provided for the pumping station is located in the southwest corner of the old section of the building, and the sewage is taken care of by two cesspools, connected in series, located some 20 feet south of the building. The effluent from the second tank seeps through open block tile drain into the ground. The pumping plant as a whole, consisting of the machinery and wells, is kept in excellent condition and can well be considered a model plant.

As a result of the reinspection of the public water supply of Westbury, it was concluded that the water supply at the time of the inspection was apparently of a satisfactory sanitary quality, but that the municipal authorities in charge of the water supply have in part carried out the previous recommendations of this Department; that there remain certain possibilities for serious contamination of the water supply due to the close proximity of the privies and cesspools to the wells, and the fact that under certain hydraulic conditions caused by the variations of the ground water flow and the excessive drafts on the wells they may pollute the water supply by percolation through the soil.

It was therefore recommended that all privies within a radius of 500 feet of the wells be provided with watertight containers, and all cesspools within that distance be made impervious and that they be maintained in satisfactory condition and properly cleaned whenever necessary and the contents disposed of in a sanitary manner in some remote place; that a sewerage system be constructed to take care of the houses within the immediate vicinity of the plant; and that the authorities maintain a careful sanitary patrol within the vicinity of the wells at all times in order to locate and eliminate any possible sources of pollution.

WEST HAVERSTRAW (New York State Hospital for the Care of Crippled and Deformed Children)

Plans for additions to the water supply system serving the New York State Hospital for the Care of Crippled and Deformed Children at West

Haverstraw, Rockland county, N. Y., consisting of architect's drawing No. 2029, were submitted to this Department for approval on August 6, 1920. After careful consideration by the Engineering Division, the plans were approved on August 11, 1920.

WINDSOR

A reinspection of the public water supply of the village of Windsor was made on May 18, 1920, by Mr. W. J. Erickson, engineering assistant, a previous inspection of this supply having been made by this Division in 1915.

Windsor, a village with a present population estimated at 750, is located in the southern part of Broome county, on the Susquehanna river. Practically the entire population is served by the supply. The waterworks are owned and operated by the village.

The water is derived from a small upland watershed about 2 miles northeast of the village. At times of drought it is necessary to supplement this supply by pumping from a driven well located about a quarter of a mile south of the village. From the intake the water is delivered to the consumers through a distribution system consisting of 4 miles of castiron mains ranging in size from 4 to 8 inches in diameter. The well supply is pumped into mains against the pressure maintained by the storage reservoir.

The upland supply is developed by the construction of a masonry dam about 15 feet long and 2 feet high across a small brook. This dam diverts the water into a small masonry chamber 5 feet by 8 feet in plan and 5 feet deep. From this chamber the water flows into an 8-inch main leading to the village. The intake end of the main is covered with a metal screen.

The watershed tributary to the upland supply is approximately 0.5 of a square mile in area; about half of this is covered with timber and the remainder is cultivated land and pasture. There are but 2 houses on the watershed, and both of these are about a quarter of a mile from the stream. The chief source of contamination is surface wash from manured fields. There is also the ever-present possibility for incidental, accidental, or willful contamination due to chance visitors on the watershed. The inadequacy of this supply, while due partly to the small size of the watershed, is also due in part to the incomplete development of the stream and the small storage. It is intended to better develop the supply by the construction of a concrete dam which is to form a reservoir which is also to be used for storage.

The reservoir is located on a hillside southwest of the village. It is circular in plan, with vertical sides, and is constructed of concrete. The reservoir is surrounded by an embankment which excludes surface wash and is surrounded by a high wire fence and by a low fine mesh wire screen around its perimeter.

The well from which the auxiliary supply is obtained is located about a quarter of a mile east of the reservoir and is about 50 feet from the highway running south from the village and about 500 feet from the west bank of the Susquehanna river. The nearest house is about 200 feet from the well, at a higher elevation. Within a radius of a quarter of a mile of this well the population may be estimated at about 500 per square mile. The watershed tributary apparently to the well may be estimated at .529 mile, most of which is used for pasture land or is under cultivation. At times of floods and ice jams the area in the vicinity becomes flooded, but at these times there is an adequate supply from the upland source and the well is not used. The well is about 80 feet deep, and is said to pass through loam, gravel, and rock, and finally to water bearing gravel. It is probably cased to the rock. A shed is provided over the well. The pumping station is a one-story concrete building located near the well. The pumping equipment consists of two Gould triplex pumps operated by 10-hp. Westinghouse motors. Each pump has a capacity of about 90 gallons per minute. The pump house and surroundings were not in a neat and well-kept condition at the time of the inspection.

As a result of the reinspection it was recommended that the village authorities make regular inspections of the watershed in order to detect and remove any source of contamination found thereon; that the upland supply be more adequately developed; that the pump house and surroundings be put in a neat condition; that no land within a radius of 100 feet of the well be fertilized or cultivated; that the area 30 feet in radius from the well be surrounded by a fence, and trespassing prohibited within it; that all privies within 500 feet of the well be provided with water-tight removable containers, and the contents of the containers disposed of in a sanitary manner at some remote place; that the casing be provided with a concrete collar so as to prevent surface wash from entering the well; and that should algae growths occur on the reservoir, the reservoir be emptied and cleaned thoroughly; and that the construction of a roof be considered.

WOLCOTT

A reinspection of the public water supply of the village of Wolcott was made by Mr. Earl Devendorf, assistant engineer in this Department, on September 27, 1920, a previous inspection of this supply having been made by this Division in 1915.

Wolcott is an incorporated village of some 1,300 inhabitants located on Wolcott creek, in the northeastern part of Wayne county. The water supply is owned by the village and operated under the direction of a board of trustees.

The supply is derived from springs located in the middle of a cultivated field about 2 miles southeast of the village. They are surrounded by a wire fence, but there are no drainage ditches to prevent surface wash from entering the small reservoir near the springs. The topography of the ground surrounding the springs, however, is such that there is little opportunity for surface wash to enter the supply except at times of spring thaws or very heavy rainfalls. The water flows by gravity from the springs to the pumping station in the village, where it is pumped into the distribution system.

The inspection was made as a result of a communication received from the local health officer informing this Department of a shortage of water and requesting information concerning a proposed auxiliary source of supply. At the time of the inspection it was learned that the village had engaged Mr. Charles C. Hopkins, consulting engineer of Rochester, to aid them in augmenting their present supply, and that he had advised them to build a storage reservoir to hold approximately 10,000,000 gallons of water, to be located just above the present pumping station.

As a result of the reinspection it was recommended that, as previously recommended, suitable drainage ditches be constructed about the springs and intake to prevent any surface wash from entering the water supply, and that if the proposed reservoir be constructed, care be taken to protect suitably the reservoir from both permanent and chance contamination.

WORCESTER

A reinspection of the public water supply of the village of Worcester was made by Mr. W. J. Erickson, sanitary inspector in this Department, on October 15, 1920, a previous inspection of this supply having been made by this Division in 1916.

Worcester is an unincorporated village of about 1,300 inhabitants located in the eastern part of Otsego county, 20 miles northeast of Oneonta. The water supply is owned and controlled by the Worcester Water Company. There are no public sewers in the village; septic tanks, cesspools, and privies are in general use.

The supply is derived from a small lake known as Caryl lake. From this lake the water flows by gravity through about 7 miles of mains varying from 4 to 10 inches in diameter. The average daily consumption is estimated at about 120,000 gallons.

Caryl lake, from which the supply is derived, has an area of about 40 acres and an average depth of about 20 feet. The level of the lake has been raised 2 feet by the construction of a small concrete dam. The intake is several feet below the surface and about 75 feet from shore at the southern or outlet end of the lake.

The lake has a watershed about 0.16 square mile in area. The village has purchased practically all land bordering the lake except a small stretch of woods on the eastern shore. The area purchased has been fenced and pine trees have been set out around the intake end. The two dwellings mentioned in the report on the 1916 inspection were located in the area purchased by the village, and there are now no permanent sources of pollution on the watershed. A shack located in the woods on the eastern shore is about 50 feet from the shore of the lake. There were evidences of this shack being used for the stabling of horses. The area in this part of the watershed is rather flat and swampy and is apparently used to some extent for pasturing.

It was therefore recommended that the water company continue to take every precaution to keep the supply in a satisfactory sanitary condition at all times.

YOUNGSTOWN

A reinspection of the public water supply of the village of Youngstown was made by Mr. Earl Devendorf, assistant engineer in this Department, on June 11. 1920, previous investigations of this supply having been made by this Division in 1915 and 1917.

Youngstown is an incorporated village located in the northern part of Niagara county near the mouth of the Niagara river, and has a population of about 600 inhabitants. There is no public system of sewers, although there are several individual sewers discharging into the river at a point above the intake of the public water supply. The public water supply is taken from the Niagara river at a point near shore and receives only that purification which is afforded by passing the water through a pressure mechanical filter. It is stated that the supply is not used by the residents for drinking or culinary purposes, local private wells furnishing such supply.

At the time of the inspection the operator at the pumping station was not present, and therefore could not be interviewed as to the schedule of operation of the filter plant; neither could the amount of alum being used, which is applied by means of the shunt system, be determined. It is evident. however, that beyond the application of alum the operating conditions of the water purification plant remain practically the same as at the time of our last inspection. Some agitation, however, has recently been started for the purchase of a chlorination plant, although no definite decision has been reached.

In view of the above facts it may be concluded that the public water supply of the village of Youngstown as derived from the Niagara river is grossly polluted, and that the present filter plant as operated does not effectively remove all contamination, and that the local officials in charge of the public water supply have failed to carry out the former recommendations of this Department as to the installation of the chlorination plant, which together with the present filter plant should if properly operated provide a water of satisfactory sanitary quality.

It was therefore recommended, that as previously recommended, the village authorities secure the services of a competent engineer to advise them as to the best and most economical means of making the necessary changes in the waterworks plant in order to provide a safe and wholesome water at all times; and that the village authorities immediately install a chlorination plant, and that the apparatus after installation be operated at all times in a satisfactory and effective manner so as to obtain a proper degree of bacterial purification.

INVESTIGATIONS OF COMPLAINTS RELATING TO STREAM POLLUTION

INVESTIGATION OF COMPLAINTS RELATING TO STREAM POLLUTION

The pollution of the watercourses of the State is a matter affecting very closely the health of the people. With the increase of population and consequent increase in volume of sewage discharged into the watercourses of the State from municipalities, and with the increase in manufacturing establishments from which wastes of widely varying kinds are discharged, the pollution of the streams tends always to become greater. The greater demand upon the streams to supply water to the increased populations and its more extensive use for manufacturing and agricultural purposes requires that the purity of the water shall be carefully protected. Furthermore, the discharge into the watercourses of this State of sewage, industrial wastes, and other refuse is a source of many complaints made each year to the Department. These complaints usually come from property owners and other persons directly affected by nuisances arising from stream pollution. Very often requests for assistance and advice in dealing with cases of stream pollution come from local boards of health or other municipal officials.

Where such procedure is feasible, the complaints are referred to local boards of health for suitable action under the provisions of the Public Health Law, but in many cases it becomes necessary for the Engineering Division to make careful investigations and prepare reports describing the conditions found to exist and the extent to which they give rise to nuisance or menace to health. Copies of these reports containing conclusions and recommendations as to the remedial measures which should be taken are then transmitted to the local authorities.

The reports upon the more important of such cases which came before the Department during 1920 are given below, and a list is also appended of all other cases.

BOONVILLE

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

DEAR SIR.— I beg to submit the following report upon an investigation of alleged objectionable conditions created by the improper disposal of

wastes from the factory of the Boonville Condensed Milk and Cold Storage Company, Inc., at Boonville, Oneida county, N. Y., which was made the subject of complaints to this Department. Briefly stated, the substance of the complaints is that the whey and other wastes from the Boonville Condensed Milk and Cold Storage Company are discharged into the Black River Canal and a small creek which flows along lower Schuyler street, creating insanitary and objectionable conditions which are detrimental to the health of the community.

The investigation was made on May 25, 1920, by Mr. A. I. Howd, assistant engineer in this Department, accompanied by Dr. J. W. Douglas, health officer of the village of Boonville. The factory, the stream and its surroundings, were carefully inspected, and several residents living in the vicinity were interviewed.

The factory of the Boonville Condensed Milk and Cold Storage Company, Inc., of which Mr. Frank Rogers is president, is located in the southeastern part of the village of Boonville between the New York Central railroad tracks and the Black River canal. The Boonville Condensed Milk and Cold Storage Company assumed ownership of the plant on April 1, 1920, but the Boonville Creamery and Cold Storage Company, the former owners of the plant, continued to operate the cheese factory temporarily for the new owners, who were engaged at the time of the inspection in the construction of a new condensary. It was stated that the new firm would take over the milk business about August 1, 1920, and become engaged in the manufacture of condensed milk. At the time of the inspection the factory was engaged in the manufacture of cheese and butter, employing five men. About 29,000 pounds of milk were received daily, about 2,000 pounds of cheese manufactured, and about 750 pounds of butter made daily. The proposed condensary will have a capacity of 150,000 to 200,000 pounds of milk daily.

The water supply of the factory of the Boonville Condensed Milk and Cold Storage Company is obtained from the public water supply of the village of Boonville. The factory is provided with a flush closet which discharges sewage directly into the Black River canal. When the canal is empty the sewage flows down the bank of the canal and creates insanitary conditions.

In general, there are two classes of industrial wastes to be disposed of from the factory: The first is whey, which amounts to about 3,000 gallons daily, about one-third of which is taken away by farmers; the second class of wastes consists principally of wash water from floors, cans, and apparatus, and contains slight quantities of whey, curd, and other matter. No estimate could be given as to the amount of water used daily for washing purposes.

The whey is pumped through a 1¼-inch pipe to an open vat, 5 feet by 18 feet by 13 feet deep, located outside the factory building. The surplus overflows the vat and runs, together with the whey that leaks out of the vat, through a ditch onto the bank of the canal. The canal, which was empty at the time of the inspection, contained quantities of whey and decomposing organic matter. The waste water and washings are collected by floor drains and discharged through a 4-inch castiron pipe down the bank of the canal.

When the canal is empty, the wastes from the factory flow down the bed of the canal in a northerly direction, together with the water from a small stream which enters the canal a short distance south of the factory. The wastes and water flow through the canal for about 2,000 feet and then divide, a portion flowing on through the lock near Schuyler street and the other portion flowing into a small creek, an outlet of the canal. This creek flows along lower Schuyler street for several hundred feet, crosses Schuyler street, shortly after which it unites with Mill creek. Mill creek flows in a northeasterly direction and discharges into the Black river, from which the water supply of the city of Watertown is derived.

The milky wastes could be traced in the canal for several hundred feet below the plant, but no objectionable odors could be detected except in the immediate vicinity of the plant. Several hours previous to the inspection, water was run into the canal through the Forestport feeder and allowed to run out through the creek along lower Schuyler street. Such a volume

of water was flowing through the creek at the time of the inspection that it was impossible to observe the former condition of the creek. It was alleged by people living in the vicinity that the bed of the creek was covered with a thick slime, red in color, which gave off a very disagreeable and offensive odor, and that on account of the odor they were obliged to close the doors and windows of their houses. It was stated by people interviewed that the objectionable conditions occur only in the spring when the canal is empty and there is very little water flowing down the creek, but as soon as the canal is filled with water the wastes from the factory become sufficiently diluted and there is enough water flowing down the creek from the canal to prevent the creation of conditions of nuisance.

These conditions concerning which complaints have been made may also be due partly to the discharge of sewage from the village into the canal and the creek. The village of Boonville, practically all of which is served with sewers, has, however, no comprehensive and systematic system of sewerage. As far as could be learned, the village began a number of years ago to construct sewers and drains and discharge them into the small streams flowing through the village. From time to time additional sewers have been constructed by citizens, by the village corporation, and some by joint effort of the citizens. Generally speaking, the sewage from the western part of the village discharges into Mill creek, while the sewage from the eastern part discharges into the Black River canal. A large sewer serving a portion of the eastern part of the village discharges into the canal near the stream, the outlet of the canal, which, flows along the south side of lower Schuyler street. The houses on the south side of this street have private sewer connections to the creek, while the sewage from the houses on the other side of the street is collected by a sewer in the street and discharged into the creek on the north side of the street.

As a result of this investigation it seems that the insanitary and objectionable condition of the small stream which flows along lower Schuyler street, in the village of Boonville, is caused both by the discharge of wastes from the factory of the Boonville Condensed Milk and Cold Storage Company, Inc., into the Black River canal, and by the discharge of sewage from portions of the village of Boonville into the Black River canal and the stream. The discharge of sewage from the sewers in the village and of wastes from the factory into the Black River canal constitutes direct violations of the Public Health Law, since no permission has been granted by this Department for the discharge of sewage from the sewers in the village or for the discharge of wastes from the Boonville Condensed Milk and Cold Storage Company, Inc.

These violations of the Public Health Law should be called to the attention of the village authorities and the owners of the factory. The owners of the factory should be advised to provide some proper method of treatment of the wastes from the cheese factory and the condensary before their discharge into any watercourse. The company should employ a competent sanitary engineer to advise them as to the most feasible and satisfactory method for the treatment of the wastes from their plants, and plans showing the proposed method of treatment should be submitted to this Department for approval in accordance with the provisions of the Public Health Law.

The sewage from the village of Boonville is, generally speaking, disposed of in an improper and insanitary manner. The question of sewerage conditions in Boonville has been before this Department on previous occasions, and the authorities have been advised to prepare plans for and construct a comprehensive sewer system and sewage disposal works. With certain additions, alterations, and extensions, it would seem that the existing sewers might be incorporated into a comprehensive sewerage system, the sewage from which might be conveyed to some point for treatment and ultimate disposal. The unsatisfactory and insanitary conditions that are now created in the village of Boonville could be eliminated in an economical, sanitary, and permanent manner. The village authorities should therefore be advised to employ a competent sanitary engineer to prepare plans showing the

existing sewers and the proposed sewers which will provide the village of Boonville with a comprehensive sewerage system, and showing a disposal plant for the treatment of the sewage. These plans should be submitted to this Department for approval in accordance with the provisions of the Public Health Law.

In view of the above facts I therefore recommend:

1. That the Boonville Condensed Milk and Cold Storage Company, Inc., be advised to employ a competent engineer to prepare plans for the treatment of wastes from the factory and condensary at Boonville, the plans to be submitted to this Department for approval.

2. That the village authorities of Boonville be advised to employ a competent sanitary engineer to prepare plans for a comprehensive system of sewerage and sewage disposal plant for the village, and to construct as soon as possible such portions of the system and disposal plant that may be necessary to eliminate the present objectionable and insanitary conditions created by the discharge of the sewage into the Black River canal and Mill creek.

I further recommend that copies of this report be sent to the local board of health of the village of Boonville, to the sanitary supervisor of the district, to the Boonville Condensed Milk and Cold Storage Company, Inc., and to the village authorities.

Respectfully submitted
THEODORE HORTON
Chief Engineer

Albany, N. Y., *August* 26, 1920

Copies of this report were sent on August 27, 1920, to the village authorities, to the local board of health, and to the Boonville Condensed Milk and Cold Storage Company, Inc.

CANANDAIGUA

Hermann M. Biggs, M.D., *State Commissioner of Health:*

Dear Sir.— I beg to submit the following report on an investigation of the pollution of Canandaigua outlet by the sewage and trade wastes from the city of Canandaigua, Ontario county, N. Y. This investigation was made on July 20–23 and August 12, 1920, by Mr. W. C. Emigh, assistant engineer in this Department, as a result of complaints received from town and village authorities below Canandaigua in regard to such pollution.

Canandaigua is an incorporated city of about 8,000 inhabitants. It is situated at the foot, or the northern end, of Canandaigua lake, and at the head of the outlet which bears the same name. It is the county seat of Ontario county, and is located near the center of that county. The city is on the Auburn branch of the New York Central railroad, and is the northern terminus of the Northern Central division of the Pennsylvania railroad. It is provided with trolley service to Rochester. Although there are several industries and factories in Canandaigua, the city is largely of a residential character. During recent years the increase in population has not been rapid. Census returns of 1890 show a population of 5,868; of 1900, 6,151; of 1910, 7,217; of 1915, 7,501. A report of the 1920 census shows a population about 150 less than in 1915. However, city officials familiar with the housing conditions at the present time and in 1915 are confident that these last returns are in error, as 100 more houses are now occupied than were occupied five years ago. In view of this, it is believed that the present population may safely be estimated at 8,000.

The water supply of the city is obtained from Canandaigua lake. The intake is located about 2 miles up the lake and 500 feet from shore in about 50 feet of water. This water is pumped direct to the mains and reservoir and is used without purification of any kind. Practically all of the inhabitants are users of this water. The average daily consumption

approximates 1,000,000 gallons. This consumption varies somewhat with the seasons, being greatest during the summer months. About 150,000 gallons are used daily by the several industries and railroads.

Canandaigua outlet, into which the sewage and trade wastes of Canandaigua are discharged, flows from the lake about 8 miles in a northeasterly direction through Chapin, Shortsville, and Manchester; thence easterly about 12 miles through Clifton Springs and Phelps; thence northerly about 8 miles to Lyons, at which point it empties into the Clyde river.

Chapin is an unincorporated village with a population of about 100, located 4 miles below the head of the outlet. Shortsville, an incorporated village of 1,228 inhabitants, is located about 3 miles below Chapin. Manchester, an incorporated village of 1,115 inhabitants, is located about 1 mile below Shortsville. Clifton Springs, an incorporated village of 1,664 inhabitants, is located about 5 miles below Manchester. Phelps, an incorporated village of 1,375 inhabitants, is located about 5 miles below Clifton Springs. These statistics of population are based upon the census of 1915.

Previous Investigations and Data

By special act of the Legislature passed June 15, 1886, the village of Canandaigua was empowered to purchase lands along the outlet of Canandaigua lake and the water power at Chapin, located on that stream, and to construct a public sewer along the bed of the outlet for the purpose of obtaining drainage and sewerage for the village of Canandaigua. This act also made certain provisions for the artificial control of the flow of water from the lake into its outlet, with the evident intention of maintaining a sufficient flow at all seasons of the year to avoid the creation of a nuisance. Under the provisions of this act the village acquired certain property rights on both sides of the stream as far as Chapin. The dam at that point was removed for the purpose of maintaining an unobstructed flow through that section. The cost of these property rights and improvements totaled about $28,000.

The larger portion of the sewerage system of Canandaigua was built previous to the year 1903. In 1904 permits were granted by this Department for the construction of sewers on Hubbell and Catherine streets. In 1906 a complaint was received alleging that a nuisance and insanitary condition existed owing to the pollution of the outlet by the sewage of the village of Canandaigua. The complaint was investigated by a representative of this Department, who recommended that a settling tank be constructed to treat the sewage of the village before its discharge into the outlet, and that gates be installed and operated in such a manner as to regulate and equalize the flow of water from the lake into the outlet, thus avoiding the condition of small dilution during periods of minimum natural flow. In 1907 further complaints were received by this Department. In the fall of 1907 application was made by the village for permission to construct sewage in Lisk avenue and Gorham street. A provisional permit was granted for these sewers January 28, 1908, which permit expired January 28, 1910. It thus appears that these sewers, and any other sewers or sewer extensions which may have been constructed subsequent to 1905, are now used in violation of the Public Health Law.

Canandaigua became a city April 28, 1913. In that year further complaints were received by this Department regarding the pollution of the outlet by the sewage of the city. In 1916 complaints were again received of the pollution of the outlet. In this year a detailed investigation was undertaken by this Department in order that the exact degree and nature of the alleged pollution might be ascertained. The report of this investigation will be found in the 38th Annual Report, Volume II, page 171. As a conclusion of this report, it was stated that a nuisance existed at times in Canandaigua outlet owing to the discharge of the domestic and trade wastes of the city of Canandaigua into that stream. It was recommended that the City of Canandaigua be required to submit plans for sewage disposal works and to construct certain portions of same immediately. It was further

recommended that the Lisk Manufacturing Company, the Canandaigua Gas Light Company, and the New York State Railways be required to construct separate and individual settling tanks or to connect their sewers and drains to the sewer system of the city of Canandaigua, or both.

Shortly after the completion of this investigation and report the nation became involved in war. As a result of conditions arising therefrom and in line with the general policy adopted by the State, certain projects which would otherwise have been prosecuted were deferred.

In July of this year resolutions were adopted by the town board of Manchester and Hopewell, and the village boards of the villages of Phelps, Manchester, Shortsville, and Clifton Springs, setting forth certain alleged conditions of pollution of Canandiagua outlet and public nuisances arising therefrom, due to the discharge into that stream of the sewage of the city of Canandaigua, and petitioning that action be taken by the State Department of Health to remedy the alleged conditions. In order that existing conditions might be accurately determined this investigation was undertaken.

Sewer System

The sewer system of the city of Canandaigua consists of about 17 miles of sanitary sewers and 9 miles of storm water drains. The system is divided into two districts, namely the west side system which includes about one-quarter of the city, and the east side system which includes the remaining three-quarters. The sewers on the west side vary from 8 inches to 18 inches. There is some roof water, but there are no catch-basins draining into the sanitary sewers. The sewer system serves about 90 per cent of the inhabitants, and the total average sewage flow was estimated to be about 1,000,000 gallons, or a quantity about equivalent to the water consumption. The outfall of the west side sewer is located in the bed of Canandaigua outlet about 400 feet below Main street. The east side sewer outfall is located in the bed of Canandaigua outlet about 300 feet below Saltonstall street.

Flow of Outlet and Dilution Factors

Canandaigua lake at its outlet has a watershed of 188 square miles. The surface area of the lake includes 18.6 square miles. The outlet has two channels for the first two miles of its length. The natural channel leaves the lake about one-half mile east of the foot of Main street, from which point it follows a winding course. The head of the artificial channel is at the foot of Main street, between the shipping dock and the swimming pavilion. The flow through both outlets is largely controlled by stop planks or weirs. During periods of low flow nearly all water is passed through the artificial outlet. It is thus possible to obtain a limited regulation of the dilution of sewage, all of which is discharged into the artificial outlet.

In the following table will be found the total flow of the two outlets during the month of each year in which the minimum mean daily flow occurred, from 1908 to 1919. There will also be found the mean daily flow of the period of four consecutive days of each year in which occurred the minimum mean flow of all such periods. These figures for flow were obtained by reducing the results of stream gaugings of the outlet at Alloway in proportion to the respective areas of the watersheds of the stream at Alloway and at the head of the outlet.

YEAR	1908	1909	1910	1911	1912	1913
Month of minimum flow	Dec.	Oct.	Aug.	Sept.	Aug.	Sept.
Daily average of minimum mon.	34	47	37	37	62	24
Minimum 4-day period	Sept. 7–10	Nov. 16–19	Aug. 2–5	Aug. 11–14	Aug. 21–5	Sept. 12–15
Daily average of minimum 4-d.	28	25	27	33	49	13

Year	1914	1915	1916	1917	1918	January to June 1919
Month of minimum flow.	Oct.	June	Oct.	Sept.	Sept.	Feb.
Daily average of minimum mon............	45	44	19	54	57	53
Minimum 4-day period.	Aug. 17-20	July 16-19	Oct. 3-6	Sept. 7-10	Aug. 30-Sept. 2	Feb. 10-13
Daily average of minimum 4-day..........	34	34	12	45	32	42

On July 23, 1920, measurements of the flow in the artificial outlet indicated a volume of approximately 40 cubic feet per second. In the absence of accurate measurements of sewage discharge, the water consumption of 1,000,000 gallons per day may be considered roughly as the rate of flow of sewage. With this flow of sewage it will be readily seen from the above figures that there will be insufficient dilution ordinarily and particularly at certain seasons to prevent a nuisance, a fact which is clearly confirmed by the observations made during the investigation and which will be referred to later.

Industrial Plants

1. The Lisk Manufacturing Company, manufacturers of enamel ware. This factory is located in the eastern part of the city and employs about 500 persons. The water consumption is approximately 50,000 gallons per day. All iron ware is pickled in an acid bath before being galvanized or enameled. The acid bath is a 0.5 per cent solution of sulphuric acid and is used until very weak, when the contents of the vats are discharged into the sewer. Seven vats are in use, and the period of use of each bath is about one week. It results that an average of at least one vat is drained per day. The spent acid is discharged directly into the sewer without provision for periodic distribution of concentrated wastes. From previous analyses it is known that the wastes from this plant contain considerable quantities of iron. It is claimed by an official of the company that subsequent to the investigation of the pollution of Canandaigua outlet, made in 1916, and in accordance with the recommendations of the report of that investigation, drain connections from the pickling vats were made with the city sanitary sewers allowing the wastes of their vats to pass directly into these sewers. It was found, however, that a quantity of liquid carrying light red particles in suspension flows in a ditch from a point on Ontario street opposite the Lisk plant to the outlet. The bed of this ditch is highly colored by the deposition of solids. Drainage enters this ditch at three points and appears to come from the Lisk plant.

It is possible that the acid of the wastes from this factory exerts a slight germicidal effect on the total quantity of sewage. On the other hand, the character of the waste is such as to hinder the bacterial activity upon which nitrification depends. Furthermore, some iron salts exert a reducing effect which tends toward the depletion of the supply of available oxygen and to the generation of hydrogen sulphide, with resulting offensive odors. It thus appears that the character of these wastes is such as to exert a deleterious effect on the process of natural and unoffensive purification of sewage by dilution.

2. Canandaigua Gas Light Company, manufacturers of illuminating gas. The gas manufacturing plant is located on Main street, near the head of the outlet. About 8 tons of coal are used per day. The byproducts are coke and coal tar. The gases driven off from the coal are passed through a water seal, where most of the coal tar and the various ammonia products are removed. The gases are then passed through various washers and scrubbers to further purify the gas for illumination purposes. It was stated by the superintendent of the plant that the water consumption ranged from 30,000

to 45,000 gallons per day. The ammoniacal gas liquors are discharged into an 8-inch sewer leading to a nearby manhole. A 6-inch sewer from the plant of the New York State Railways enters this manhole; thence the combined flow passes through a short section of 12-inch sewer into the city trunk sewer; thence directly into the outlet. This waste from the gas plant contains various nitrogen compounds and some coal tar. From results of tests in the gas plant at Providence, it is estimated that the Canandaigua plant produces 105 gallons of coal tar and 40 pounds of ammonia in the ammoniacal liquor per day. All of the ammonia and some coal tar which is not recovered are now discharged into the sewer and thence pass directly to the outlet. At the time of the investigation in 1916 the wastes of this plant and of the New York State Railways plant were passing through a ditch directly to the outlet. In accordance with the recommendations of the report on that investigation, these plants have been connected to the city sewer as described. The Gas company also distributes electric power. A portion of this power is developed at their hydro-electric plant at Littleville, but the greater part is generated at Rochester by the New York State Railways and is purchased from that company.

3. New York State Railways. This company maintains carbarns and a power station on property adjoining that of the Gas company. At present the power station is used only as a substation, stepping down by means of rotary converters the current transmitted from Rochester. There are two steam-driven generators installed, of 650 kilowatt capacity each. It is stated that these generators have not been used in a number of years. When weather permits, the cars are washed out of doors, the wash seeping into the ground or running off over the surface. In winter the cars are washed indoors, and the wash water passes through a drain into Canandaigua outlet. This wash water does not appear to constitute either a concentrated or objectionable type of waste. The wash room and toilet fixtures in the carbarns are connected with the city sewer, as described in the preceding paragraph.

In addition to the above industries, the Powell Corporation operates a vinegar plant, and the Cobb Preserving Company operates a preserving plant. A new plant for the manufacture of clothing is expected to commence operation in the near future. The sewage from none of these plants is in such quantity or of such a nature as to require special consideration.

General Condition of Outlet at Time of Inspection

The inspection in July followed a period of rain and moderately cold weather. The prevailing wind was from the south which resulted in a high turbidity of the water at the northern end of the lake and in the head of the outlet. The inspection in August occurred during a period of warm weather, high turbidity, and considerable rain.

The natural outlet of Canandaigua lake is provided at the point at which the water leaves the lake and passes under a concrete highway bridge, with a concrete spillway and flash boards. At the time of the investigation the flash boards were in place and a negligible quantity of water was flowing in this channel. Water entering the artificial channel passes under a masonry arch highway culvert. On the upstream side of this culvert horizontal timbers set against vertical timbers, the latter fastened to the masonry, form a submerged weir 9 feet 8 inches in length. About 300 feet below this culvert is an old low timber dam. The condenser intake of the gas company is located about 20 feet above the dam. The west side outfall sewer of the city is located about 100 feet below the dam. Notwithstanding the turbidity of the water, the sewage rising from the sewer outfall and flowing downstream could be readily seen. Below this upper outfall sewer, oil, greasy scum, and suspended solids presented abundant evidence of sewage pollution.

At the lower or east side outfall sewer of Canandaigua, the sewage could be seen as it mingled with the turbid water of the stream. Scum and suspended solids in augmented amounts were visible below this outfall. From this point to the point of confluence of the two channels the stream flows through agricultural land.

Below the junction of the two outlets of Canandaigua lake the stream flows through marshy land. At such points as obstructions occurred at the surface scum had collected. At the Pennsylvania railroad bridge the stream was carrying some suspended matter of such size as to be plainly visible. It was stated by a number of residents living between this point and Shortsville that at times conditions of the stream are extremely offensive; that solids which have been deposited on the stream bed become dislodged in large quantities, rise to the surface and float down stream in masses from 2 to 6 inches in diameter. At Chapin the flow is rapid above the bridge owning to the removal of the dam as previously described; below the bridge a good current exists. From Chapin to the pond at Littleville there is in general a good current, and few if any places in which sewage would tend to accumulate. There was in this section a considerable growth of grass and weeds in the stream. Near the east bank organic growths in the form of a green scum was found.

At the Littleville hydroelectric plant a boom was stretched across the flume. A quantity of greasy scum had collected above this boom. The water entering the flume was carrying scum. Accumulations of scum were lodged against the dam and east shore of the pond. Gas was rising through the water in the section of the flume extending from the racks to a point about 30 feet back of them. The operator at the hydroelectric plant stated that at times large quantities of floating solids lodge in the flume and above it and that at such times the odor is very offensive. In order to dispose of this floating matter it is necessary to open a gate in the side of the flume. He pointed out a quantity of this solid matter which had been sluiced out of the flume and had lodged in the dry portion of the stream bed below the dam. This deposit gave off a strong objectionable odor of undigested sewage sludge. A considerable quantity of scum had collected on the surface of the back water under the highway bridge a short distance below the dam and was in a putrefactive condition. The dam which impounded water at Littleville at the time of the previous investigation failed in 1917. It appears that the water thus released from the pond by the failure of the dam flooded certain buildings in Shortsville. It was stated by residents of that village that the receding waters left a large quantity of solids and sludge which was easily recognized as coming from sewage. From the preceding it appears evident that quantities of sewage solids are carried down as far as the Littleville pond, where some deposition occurs followed by putrefaction and the creation of objectionable conditions.

At Shortsville the outlet skirts the main part of the residential section but passes through the industrial section. At the upper end of the village a low dam diverts the flow of the stream into a raceway serving the Papec Machine Company and the Shortsville Paper Company. The dam is of timber construction and in such a condition that considerable leakage occurs. A diversion of the major portion of the water tends materially to decrease the current in the natural stream bed. A fairly large pond is formed in the industrial section by a second dam of concrete located near the street bridge. The water which enters the raceway above the upper dam is returned to the stream below the lower dam. At the time of the investigation the Papec Machine Company was discharging a considerable quantity of sewage and industrial wastes into this pond at two points. The discharge of untreated sewage and wastes into this poind under the conditions of low flow or of quiescence would tend to increase conditions of pollution and resulting nuisance at this point. The village health officer of Shortsville reported that at times conditions there are extremely offensive and that he believes a distinct nuisance is created.

Between Shortsville and Manchester the flow is in general fairly rapid, and it is improbable that any deposits of sewage sludge exist in this section. At the village of Manchester the area formerly flooded by a dam is now dry. The stream is confined to a channel of normal width and maintains a fair rate of flow through the village. From the village of Manchester to the settlement of Manchester Center the stream flows through agricultural land at a considerable distance from the highway. Through Manchester Center

the flow is somewhat more sluggish owing to back water caused by the stones piled in the stream, the remains of an old dam. A short distance above the bridge which is located just north of Manchester Center some scum was seen lodged against a growth of weeds. From this point to a bridge ¾ of a mile southwest of Gypsum, a distance of about 2½ miles, the stream flows through an agricultural section but at a considerable distance from the highway. A short distance below the last mentioned bridge stones are piled across the stream, thus diverting the flow into a canal leading to the mill. Several accumulations of scum were found in this section. Below Gypsum the highway follows the general course of the stream the greater part of the distance to Phelps. A section of the stream about one mile long and beginning at a point about one mile below Gypsum has a low velocity. From this point to the upper end of the Upper Mill pond at Phelps, a distance of about 2½ miles, the velocity in general is good. Occasionally scum was found in this portion of the stream.

The outlet flows through the village of Phelps but is outside of the built-up portion. Two water powers have been developed in this section about half a mile apart. The upper dam, constructed of timber with masonry piers, abutments, and wing-walls, is in place, but the mill in which the power was used has recently been destroyed by fire. This dam backs water in two channels for a considerable distance. Below the dam the scum was seen in slack water.

At the lower dam, which is of concrete, hydraulic power is developed for use in a grist mill. At this point scum was found at the head-gates. Below the dam Flint creek discharges into the outlet. Considerable rain had occurred during the afternoon and evening preceding the investigation at this point, and the water in this brook was highly turbid and of a brownish color. The water in the outlet just above the point of confluence of the streams was fairly clear and such turbidity as it carried was of a grayish color.

Summary and Conclusions

As a result of this investigation, together with the results of previous investigations and data at hand, and after a careful consideration of the conditions of the stream above and below the points of pollution, and the volume of flow required properly to care for the quantity of sewage and other wastes discharged into Canandaigua outlet, at Canandaigua, the following summary and conclusions are presented:

1. That owing to the quantity of domestic sewage and trade wastes discharged into the outlet of Canandaigua lake from the city of Canandaigua and to the comparatively low flow of water through the outlet during the summer and fall months, a public nuisance is created, which condition of nuisance would be intensified at times when the flow of the outlet is less than occurred during this investigation.

2. That the nuisance is largely due to the discharge into Canandaigua outlet of domestic sewage from the city of Canandaigua, and to a lesser extent to trade wastes from the plants of the Lisk Manufacturing Company and the Canandaigua Gas Light Company.

3. That due to the increasing quantity of sewage as indicated by the water consumption of the city of Canandaigua, the pollution of the waters of Canandaigua outlet therefrom is greater than at the time of the investigation of 1916.

4. That subsequent to the investigation of the pollution of Canandaigua outlet in 1916, and in partial accordance with the recommendations of the report on that investigation, drain connections were made with the city sanitary sewers permitting the discharge thereinto of a portion of the industrial wastes of the Lisk Manufacturing Company, but that a part of these wastes continues to flow through an open ditch to Canandaigua outlet into which it is discharged.

5. That subsequent to the investigation of the pollution of Canandaigua outlet in 1916, and in accordance with the recommendations of the report on that investigation, connections have been made with the city sanitary

sewers permitting the discharge thereinto of the sanitary sewage and industrial wastes of the Canandaigua Gas Light Company and the New York State Railways, and that these sanitary and industrial wastes are so discharged.

6. That the pollution of the waters of Canandaigua outlet is increased by the discharge into these waters of the sanitary sewage and industrial waste from the plant of the Papec Machine Company located at Shortsville.

Recommendations

In view of the above I would recommend:

1. That the city of Canandaigua be required to submit to this Department satisfactory plans for proper sewage disposal works designed to treat the entire sewage of the city before it is discharged into the outlet of Canandaigua lake. These plans should include treatment by both sedimentation and filtration, or methods equally satisfactory.

2. That after the approval by this Department of the above mentioned plans, the city of Canandaigua be required to construct the sedimentation tanks at the earliest possible date, and that permission be granted, upon application therefor by the city, for the deferment of construction of the filter until such time as the Commissioner of Health shall deem such construction necessary.

3. That the Lisk Manufacturing Company be required to make suitable drain and sewer connections and to discharge all of the sanitary sewage and industrial wastes from its plant at Canandaigua into the sanitary sewers of that city.

4. That provision be made by the city of Canandaigua for a more flexible and positive regulation of the flow of water from Canandaigua lake into its outlet than is now possible.

5. That the Papec Machine Company prepare and submit to this Department satisfactory plans showing details of construction and operation of a plant designed properly to treat its sanitary sewage and industrial wastes and upon the approval of same construct the plant in accordance therewith.

I would further recommend that copies of this report be sent to the Governor, boards of health of the towns of Manchester and Hopewell; the villages of Shortsville, Manchester, Clifton Springs, and Phelps; and the mayor and common council of the city of Canandaigua; to the sanitary supervisor of the district, the Lisk Manufacturing Company, and the Papec Machine Company.

Respectfully submitted

THEODORE HORTON

Chief Engineer

ALBANY, N. Y., *August* 19, 1920

Copies of this report were sent on August 20, 1920, to the Governor, to the sanitary supervisor, to the city authorities of Canandaigua, to two manufacturing plants discharging wastes into the stream, and to the complainants. On October 25, 1920, a notice of hearing and an order to show cause was sent to the city of Canandaigua. At the hearing held at Albany on November 9, 1920, it was stipulated that the city of Canandaigua was to submit plans to the State Department of Health by March 1, 1921, and to submit the bond proposition to the people of Canandaigua in June or July, 1921, and that the excavation and preliminary work be begun not later than August 1, 1921, and that the plant should be completed by July 1, 1922.

CHAUMONT

HERMANN M. BIGGS, M.D., *State* ...missioner of ...

I beg to submit the following report upon ... investigation of alleged insanitary and objectionable conditions created by improper disposal of wastes from the Chaumont ... station, ... Chaumont, Jefferson

county, N. Y. The investigation was made as a result of complaints received at this Department in regard to the pollution and the insanitary conditions caused by the discharge of wastes from the factory into Saw Mill bay. The factory and its surroundings were carefully inspected, and the methods of operation of the factory, the disposal of wastes therefrom, and the effects of their discharge upon Saw Mill bay were examined. The investigation was made on May 26, 1920, by Mr. A. I. Howd, assistant engineer in this Department, accompanied by Dr. O. J. Lafontaine, health officer of the village of Chaumont.

Chaumont is an incorporated village having a population of about 700, located in the west-central part of Jefferson county. It is on the Cape Vincent branch of the New York Central Railroad, about 14 miles from Watertown. The village is located on a peninsula which extends into Chaumont bay. The Chaumont river is on the northwest side of the village, and Horse creek on the southeast side. The soil in and surrounding the village is a clayey loam for a depth of about one foot which is underlain by fissured rock. In numerous places the rock outcrops at the surface of the ground. The village has no public water supply and no sewerage system.

The Chaumont Milk station is located outside the eastern village line, about 0.3 mile from Horse creek and Saw Mill bay. The factory, which is owned and operated by E. W. Coon, of 29 South Water street, Philadelphia, Penna., was established about 1910, but has been operated by the present owner only since June, 1919. It was formerly operated by the Bordens Farm Products Company, Inc., as a milk receiving and shipping station. The factory is now engaged in the manufacture of cheese, employing from 12 to 22 men. From 8,000 to 30,000 pounds of milk are received at the factory daily, depending on the season of the year; at the time of the inspection the maximum amount was being received. About 3,000 pounds of American cheese and 1,000 pounds of whey cheese, or "Ricotta" cheese, were being manufactured daily. The usual processes for the manufacture of the cheese are employed at the plant.

The water supply for the factory is obtained from Saw Mill bay, the intake being located a short distance from the point where the wastes from the factory enter the bay. The water is pumped into two elevated galvanized-iron tanks having a capacity of 900 gallons each, located at the factory. From these tanks the water flows by gravity through the plant. The amount of water used at the plant for all purposes may be roughly estimated at 5,000 gallons daily.

The factory is provided with a one-seat Kaustine chemical closet located adjacent to the factory. When the tank becomes full, the contents are carted away and buried.

In general, there are two classes of wastes to be disposed of from the factory. The first is whey, which amounts to about 2,000 to 2,500 gallons daily, a small portion of which is taken away by farmers. The second class of wastes consists principally of wash water from floors, cans, and apparatus, and contains slight quantities of milk, whey, curd, and other matter. The amount of water used for washing purposes was estimated to be about 2,000 gallons daily.

A portion of the whey is run through a 4-inch pipe to two circular wooden vats about 5 feet deep and 8 feet in diameter located outside the factory, from which it is taken away by the farmers. The remainder of the whey is run through a separate system of pipes and disposed of with the wash water. As a result of the vats either leaking or overflowing, the ground in the vicinity was in an insanitary condition and gave off offensive odors. The wash water and surplus whey are collected by floor drains and discharged through about 300 feet of 6-inch tile onto the ground near the railroad at an elevation of about 45 feet above the bay. The wastes flow in a circuitous course for several feet and then enter an opening in the ground, from which they apparently flow through crevices in the rocks and eventually enter a cove in Saw Mill bay seemingly unchanged in character. The course of the milky wastes could be noticed for several hundred feet in

the water of the bay. Near their point of emission from the rocks and in the immediate vicinity stagnant pools of decomposing organic matter were observed which gave off offensive odors.

There are a number of houses located on a high bluff on the southeast side of the bay a short distance from the point where the wastes enter it. People interviewed stated that on warm days the odors arising from the cove and bay were very offensive. The bay is used to a considerable extent for boating and other pleasure purposes, which are affected by the discharge of the wastes into the bay.

The matter of wells becoming polluted by wastes from the cheese factory was brought to the attention of the engineer at the time of the inspection. One case in particular was investigated on a street several hundred feet south of the factory from the point of discharge of the wastes into the ground. A well 85 feet deep was drilled about four years ago and a gasoline pump installed, at a private residence. Extensive plumbing fixtures and piping were installed and the water was used for all domestic purposes including drinking. About June, 1919 (about the time manufacture of cheese was begun at the factory), the water acquired a peculiar taste and later had a noticeable whey odor. The odor of the water became so strong and disagreeable that it was impossible to use the water even for flushing the toilet fixtures. At the time of the inspection some water was pumped from the well and it was found to have a decided milky color and a noticeable whey odor. The engineer was also advised that other wells in the vicinity had become similarly affected.

The above conditions are apparently caused by the improper disposal of wastes from the cheese factory. Considerable quantities of whey and wash water are discharged into rock holes in the ground from which the wastes apparently flow through crevices in the rocks, polluting wells over 600 feet from their point of discharge into the ground and eventually entering a cove in the Saw Mill bay 0.3 mile from the factory, causing insanitary and offensive conditions. The discharge of wastes from this factory into Saw Mill bay and the ground waters tributary to it is a direct violation of the Public Health Law, since no permission has been granted to the owner of the factory to discharge wastes from the factory at Chaumont into the bay or the ground waters tributary to it. It would seem desirable therefore that he be advised to make immediate application to this Department for permission to discharge the wastes from the factory.

In view of the above facts it is evident that it will be necessary to provide some method other than that employed at present for the disposal of wastes from the factory. Whey contains such large quantities of decomposable organic matter that it is practically impossible to dispose of it by treatment in settling tanks and by discharging it into relatively small streams or small bodies of water. The whey might be discharged into tank wagons, carted away and distributed over farm land; or since the country east of the factory is sparsely populated, arrangements might be made whereby the whey might be pumped onto some farm land about a half mile distant, which would serve the double purpose both of disposing of the whey and also enriching the soil. On the other hand, it might be possible for the owners of the factory either to require or pay the farmers to take all the whey away.

The waste water and washings consist principally of water and contain small amounts of milk, whey, curd, and other matter. In cases where a body of water or stream flow is large enough to provide ample dilution, treatment of the waste water and washings in a settling tank may be sufficient. When the volume of flow in a stream or a body of water is not large enough or there is not sufficient circulation of the water properly to dilute the effluent from the settling tank treating the waste water and washings, it is necessary that supplementary works for more complete treatment of these wastes be provided, such as some form of filter; or where soil conditions are favorable, the construction of cesspools to receive and dispose of the effluent from the settling tanks.

At Chaumont the soil conditions are not favorable for the disposal of the waste water and washings in leaching cesspools. Furthermore, owing to the

character of the ground it would not be safe to discharge into the ground waters near this plant any effluent but a properly settled, filtered, and sterilized effluent. A more economical method of disposing of the waste water and washings than sedimentation, filtration, and sterilization might be afforded by treatment of the wastes in a settling tank and by discharging the effluent through a pipe line into Horse creek, about one-half mile northwest of the plant. This creek has a drainage area of about 17 square miles, and should provide proper dilution for the effluent from a settling tank to treat the waste water and washings. If it should be found after a reasonable time that the volume of flow in the stream is not sufficient properly to dilute the effluent, it would be necessary to provide supplementary works for more complete treatment of the wastes. On the other hand, the wastes might be collected and pumped back onto farm land, together with the whey. If the owner of the factory decides that some method of treatment of the wastes is the most feasible method of disposing of the wastes, plans of the proposed method of treatment should be submitted to this Department for approval.

As a result of this inspection I conclude that the insanitary conditions complained of are caused by the conditions mentioned above and I therefore recommend:

1. That the ground in the vicinity of the whey vats be put in a more sanitary condition.

2. That the owner of the Chaumont Milk Station at Chaumont be required to provide some proper and sanitary method for disposing of the wastes from the factory other than the present method of discharging them into crevices in the ground and Saw Mill bay.

3. That unless immediate action is taken by the owner of the factory to discontinue the pollution of Saw Mill bay and the ground waters tributary to it, action be taken by you under section 76 of the Public Health Law to cause the discontinuance of the pollution of these waters.

I further recommend that copies of this report be sent to the local board of health, to the sanitary supervisor of the district, to the complainants, and to the owner of the cheese factory at Chaumont.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *June 29, 1920*

Copies of this report were sent on June 29, 1920, to the local board of health, to the sanitary supervisor, to the complainants, and to E. W. Coon, owner of the factory. Plans for the treatment and disposal of wastes from the factory were submitted to this Department for approval August 17, 1920, and September 10, 1920, both sets of plans being disapproved since they were not in satisfactory condition for approval.

HOBART

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report upon an investigation of the objectionable conditions created by the discharge of creamery wastes into the West branch of the Delaware river at Hobart, which was made the subject of a complaint to this Department by the local board of health through the sanitary supervisor. The investigation was made by Mr. W. J. Erickson, sanitary inspector, on July 1, 1920, accompanied by Mr. B. L. Springs, president of the village.

Hobart, which is an incorporated village of about 600 inhabitants, is located in the northeastern part of Delaware county, and on the West branch of the Delaware river, about 4 miles southwest of Stamford, on the Ulster and Delaware railroad. Hobart receives its water supply from Town brook

and Grant brook, east of the village. From the intake dam the supply passes through a slow sand filter before it is delivered to the consumers.

The plant of the Sheffield Farms Company, Inc., of which Mr. B. J. Young is superintendent, and the plant of the Sheffield By-Products Company, of which Mr. F. L. Chappell is superintendent, are located close together in the northeastern part of the village, on the Ulster and Delaware railroad, and about 75 feet from the West branch of the Delaware river. These plants were built about 35 years ago, but since then several alterations and additions have been made to them. The average number of employees at the plants is 45, but at times it reaches as high as 60 in the summer months. The product manufactured at the Sheffield Farms Company plants is butter. Some cream is also shipped. At the Sheffield By-Products plant, casein, milk sugar, and albumen are made. An addition to the latter plant is contemplated in which milk powder is to be made.

The water supply, which is derived from the companies' own wells, is pumped to an elevated tank and thence flows by gravity to the plants. The cooling water is obtained from a pond outside the building.

Between 1,000 and 1,500 cans, holding 40 quarts of milk each, are received on the average per day, but on the day of the inspection only 500 cans of milk and 300 cans of skimmed milk were received. The milk is pasteurized and skimmed. The cream is churned into butter and the skimmed milk is delivered to the By-Products Company. On the average, about 8,000 pounds of butter are produced in a day. The buttermilk is pumped into a tank and sold to the farmers. The skimmed milk is poured into the casein vats at the By-Products plant, diluted hydrochloric added, and allowed to ferment. When this process is completed the whey is drawn off and used in the manufacture of milk sugar. The casein remaining in the vat is then washed, dried, ground and barreled. The whey is boiled in vacuum pans, and the resulting syrup allowed to stand for a day in wooden vats. It is then washed, refined, dried, ground, and barreled. Unrefined sugar from other plants is also sent here for refining. About 2,500 pounds of sugar are produced in a day.

It was stated by Mr. B. I. Sheffield, district manager, that the total amount of wastes was about 40,000 gallons a day. These are principally wastes from the washing of milk cans and other apparatus, from the washing of the butter, casein, and sugar. These wastes, especially those from the washing of the casein, contain considerable organic matter. They are generally discharged into the village sewer and passed through the village disposal plant. About the first of June, however, the sewer from the creamery became clogged, and for a period of a few days the wastes were discharged directly into the river. This gave rise to the conditions complained of.

Our inspector conferred with Mr. B. L. Springs, member of the board of trustees of the village of Hobart, who stated that about this time the stream bed became exceptionally bad and that it gave off a very disagreeable odor. The stream bed, it was stated, was covered with a heavy slimy growth which usually results from the discharge of such wastes. It was stated that these conditions had since improved, and that the rains falling during the previous two weeks had washed most of the growth away. At the time of the investigation a slight odor of decomposing organic matter was noticed just below the mill dam, and the woodwork of the dam and the bottom of the stream in the shallow places were covered with the fungus referred to. Opposite the creamery there were no organic deposits noticed, and the only discharge from the creamery consisted of the clear water from the condensers.

The cheese factory of the Cohen Dairy Company, Inc., was also visited. This plant is located about 2 miles northeast of Hobart, on the north bank of the West branch of the Delaware river. This plant has a settling tank in which only wash water is disposed of. The whey and other milky refuse is conducted into a concrete tank and disposed of by the farmers. There was only a slight discoloration at the outlet of the settling tank, but 25 feet of the stream was as clear as above the outlet. The plant appeared to be working efficiently at the time of the inspection and no complaint has been made against it.

The disposal plant of the village of Hobart was also inspected. This plant is located about three-quarters of a mile west of the center of the village. The nearest dwelling is about 1,000 feet distant. The plans for this plant were approved by this Department on November 28, 1911, and the plant was built substantially according to the approved plans. It consists of two sedimentation tanks, dosing tanks, and six intermittent sand filters. The sedimentation tanks are about 11 feet by 20 feet, with a capacity of about 12,800 gallons each, and with the present estimated flow of 100,000 gallons will give about 6 hours detention. Both of the tanks were in operation at the time of the inspection. The surface of the tank was covered with a heavy layer of scum at the time of the inspection. The dosing tanks are connected with the sedimentation tank and have a capacity of about 1,000 gallons. The total content of each dosing tank is discharged through a 6-inch siphon onto the sand filters. Only two beds were receiving sewage at the time of the inspection, two were resting, and two were drying preparatory to being cleaned. The two beds that were being dosed and the two that were resting were covered to a depth of from a few inches to about 1 foot with sewage.

It appeared from the inspection that the operation of the plant was seriously interfered with, and the filters were overtaxed by the large amount of creamery wastes which amount to about 40,000 gallons or about one-quarter of the total amount.

The beds were apparently clogged and were not operating efficiently. There is a man continuously at the plant, but the overtaxing of the plant by the trade wastes make it almost impossible efficiently to operate the plant. Although the plant could probably care for a relatively small amount of creamery wastes in addition to the present flow of domestic sewage, it is inadequate properly to care for the present large combined flow of domestic sewage and creamery wastes.

The watershed at the outlet of the disposal plant is about 32 square miles in area, and consists mostly of wooded hilly and partly open and cultivated low lands. The river above receives the effluent from the Stamford disposal plant. Below the outlet the river is not used for a public water supply in this State. A slight milky color was noticed issuing from the outlet pipe of the Hobart disposal plant, and the bottom of the stream was colored white for a considerable distance by the same effluent. No disagreeable odor was noticed, however, at the time of the investigation, but it was stated by people living near the outlet that the odor at times was very nauseating, especially in warm weather.

In the report of this Department for the year 1914, on an inspection of the disposal plant of the village of Hobart, it was pointed out that the operation of the plant was seriously interfered with by the discharge of creamery wastes into the village sewer system and the disposal plant. The creameries referred to were at that time employing a firm of consulting engineers to design a disposal plant, and the firm had been advised that consideration would be given to the issuance of a permit to discharge effluent directly into the river from a plant to treat the wastes from these two factories. Mr. Sheffield stated that nothing further has been done toward installing a disposal plant. However, the condensing and cooling water have been separated from the wash water and is now being emptied into the river direct.

The report on the investigation in 1914 contained the following recommendations:

Inverted Siphon, West Main street:

1. That the chamber be provided with a tight cover to prevent the escape of odors.
2. That the chamber be cleaned out and the siphon be put in operating condition.
3. That the siphon pipe be made tight so that the sewage will reach the disposal works.

Settling Tanks:

1. That all sludge and scum be removed from the tanks and buried in trenches or otherwise disposed of so as not to cause a nuisance. Burying is recommended on account of the odors, the presence of fly larvae, and the ability of the sludge to retain moisture which prevents its drying up.

2. That both tanks be used continuously while the sludge and scum be removed at frequent intervals so as to keep the plant in a fresh condition.

Dosing Tanks:

That the automatic siphons be overhauled and put in working condition and that the total capacity of the dosing tanks be discharged at one time with the siphons working alternately.

Sand Filters:

1. That all sludge be removed from the surface of the bed and buried.

2. That embankments around the beds be replaced with sand of the same size as that used for the beds so that starting at the top of the slope and descending the slope there will be at each point a vertical depth of 3 feet of the sand, or that some other method be used which will make the embankments equally impervious to the sewage.

3. That the gate manhole between the four sand filters be divided so that each siphon can discharge to any of these beds, and that effluent from the dosing tanks be discharged alternately by the two siphons onto not less than two beds at each discharge of a siphon.

4. That whenever a bed shows a tendency to hold the sewage on the surface too long, it should be put out of service long enough to allow the scum to dry and be removed.

5. That the beds and grounds be kept in a clean and fresh condition.

6. That sufficient labor be employed to maintain the disposal works in proper condition.

From the above considerations the following conclusions may be drawn:

1. That all of the recommendations of the report of 1914 have not been carried out.

2. That the unsatisfactory conditions of the stream flowing through the village complained of was largely due to the discharge of creamery wastes directly into the stream above the village at the time the sewer from the creamery was clogged.

3. That the village disposal plant was being overtaxed by the addition of about 40,000 gallons of creamery wastes. The plant was designed to take care of only a small amount of creamery wastes in addition to the domestic sewage of the village.

In view of the fact that the village disposal plant is overtaxed beyond the amount for which it was designed, I would recommend:

1. That the village of Hobart either provide for enlarging the present sewage disposal plant sufficiently to care properly for all of the domestic sewage and creamery or trade wastes tributary to the existing sewer system and sewage disposal plant, or, that the Sheffield Farms Company, Inc., and the Sheffield By-Products Company be required to disconnect from the village sewerage system and provide for an independent sewage disposal plant for the complete treatment of their wastes by sedimentation and filtration before the discharge of these wastes into the West branch of the Delaware river.

2. That in either case, plans be submitted to this Department for approval in duplicate for the proposed enlargement of the village sewage disposal plant or for an independent disposal plant for the plants of the Sheffield Farms Company, Inc., and the Sheffield By-Products Company.

3. That the village carry out the recommendations of our previous report with respect to the operation and maintenance of the village disposal plant.

I would further recommend that copies of this report be sent to the local board of health, to the sanitary supervisor, and to the Sheffield Farms Company, Inc., and the Sheffield By-Products Company.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *August* 18, 1920

Copies of this report were sent on August 20, 1920, to the local board of health, to the sanitary supervisor, to the village authorities, and to the Sheffield Farms Company, Inc., and the Sheffield By-Products Company.

SCHROEPPEL (Town) Pennellville

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report upon an investigation of alleged insanitary and objectionable conditions created by the discharge of wastes from the milk station and creamery of the Beakes Dairy, Inc., at Pennellville, Oswego county, N. Y., into a tile drain and thence into Potts creek, which condition was made the subject of complaint to this Department. The inspection was made by Mr. N. H. Baier, sanitary inspector of this Department, on August 24, 1920, accompanied by Dr. B. W. Severance, health officer of the town of Schroeppel.

The plant, its operation, the method of disposal of its wastes, the creek into which the wastes discharge and the surroundings were inspected. Mr. H. D. Downs, manager of the plant, and nearby residents were interviewed.

Pennellville is an unincorporated village of some 350 inhabitants, located in the southern part of Oswego county, on the New York, Ontario and Western railroad, 20 miles southeast of Oswego. The village has no public water supply or sewerage system.

The Beakes Dairy, Inc., has its main office at 206 East 12th street, New York city. It was established some 25 years ago and has been under the present ownership since 1905. The Pennellville plant was a milk shipping station up to last April, when the manufacture of cheese was begun. Some cheese has, however, been made in previous years. At present about 8,000 pounds of milk are received daily, from which about 700 pounds of Italian cream cheese and 130 pounds of whey cheese are made. There are 7 men employed throughout the entire year. The water supply is obtained from a driven well located within the plant.

There are two kinds of wastes to be disposed of from the plant, i. e., whey, of which there are about 600 gallons daily, and wash water of the floors and cans, of which there are 150 gallons daily. Both the whey and the wash water are discharged directly into a drain in the floor which connects with an 8-inch tile sewer. The latter is laid underground and just northeast of the New York, Ontario and Western railroad. There are about 800 feet of sewer, then 40 feet of open ditch, to the water's edge of Potts creek.

Potts creek rises at a point 6½ miles north, and continues for 3 miles south of Pennellville to the Oneida river. The greater part of the course of the creek is through swampy land. The drainage area above Pennellville is about 13 square miles. The creek has been dammed up at Pennellville for sawmill purposes, giving rise to a large pond whose greatest width is 300 feet and which was 2 to 3 feet deep at the time of the inspection. The water has practically no current during the summer months for a distance of about three-fourths of a mile above the dam. Below the dam there is a good flow at the center of the creek, the bed of the rest of the creek having become filled with a heavy silt. A short time ago the owner of the sawmill used about 10 pounds of dynamite to make the present small channel-way at the center.

The point of discharge of the wastes of the Beakes Dairy is about 400 feet above the dam. There were numerous patches of white scum not only

near the point of discharge but throughout the entire pond. This, together with some black, septic material and numerous leaves and twigs, gave to the pond a very unsightly and insanitary appearance. The point of discharge of the wastes of the Rosemary Creamery Company, also of Pennellville, N. Y., is 100 feet above the dam. At the time of the inspection the Rosemary Creamery was not in operation and had not been since early this spring, so that the effect on the pond of the discharge of wastes from this creamery could not be ascertained. Inspection also showed that the sanitary sewage of one, and at times, two houses, passes into a ditch, overgrown with grass, which discharges into the pond not far from the outlet of the Rosemary Creamery Company. The odors of sanitary sewage and creamery wastes were detected when crossing the highway leading across the dam.

The discharge of wastes from the plant of the Beakes Dairy, Inc., into Potts creek, which eventually discharges into the Oneida river, is a violation of the Public Health Law, since no permission has been granted and no plans approved for the treatment and discharge of wastes into the stream. The Beakes Dairy, Inc., should be notified of such violation and be requested to make application for a permit to discharge wastes into the stream.

Since the Beakes Dairy, Inc., manufactures whey cheese from the whey, so that the resulting grayish-white whey waste water has very little organic matter, it appears to this Department that the waste whey and wash water could probably be satisfactorily disposed of into Potts creek at some point below the dam, provided these wastes are first passed through a settling tank having a capacity equal to one day's flow of wastes. The ditch at the present outlet should be thoroughly cleaned of its organic matter. Application should be made to this Department by the Beakes Dairy, Inc., for permission to discharge the wastes from their plant into Potts creek, in accordance with the requirements of the Public Health Law. This application should contain or be accompanied by a plan or sketch showing the relative location of the factory and settling tank to the nearest highway, stream, and railroad, existing and proposed sewers, with size and grade, together with approximate distances and dimensions.

In view of the above facts, the following conclusions may be drawn:

1. That the discharge of wastes from the Beakes Dairy, Inc., into Potts creek without a permit from this Department is a violation of the Public Health Law.

2. That the pond above the dam is in an insanitary condition due to the discharge of creamery wastes into it.

3. That due to the stagnant condition of the pond of Potts creek above the dam during the summer months, considerable odor may result through the discharge of such wastes and give rise to a nuisance.

4. That the bed of the creek below the dam is filled with silt which hinders the flow and rapid removal of the water.

As a result of this inspection and in view of the foregoing, I would make the following recommendations:

1. That the Beakes Dairy, Inc., be notified of its violations of the Public Health Law by the discharge of wastes into the waters of the State.

2. That the wastes from the Beakes Dairy, Inc., be passed through a settling tank and the effluent from such tank be discharged into Potts creek through a water-tight sewer line below the dam instead of above as at present.

3. That the Beakes Dairy, Inc., make application to this Department for the disposal of its wastes, such application to be accompanied by a plan or sketch showing the relative location of the factory and settling tank to the nearest highway, stream, and railroad, existing and proposed sewers, with size and grade, together with approximate distances and dimensions.

4. That the Beakes Dairy, Inc., thoroughly clean the ditch between the present sewer outlet and the point of discharge at Potts creek.

I would further recommend that copies of this report be sent to the Beakes Dairy, Inc., to Dr. B. W. Severance, health officer of the town of Schroeppel, to Dr. C. R. Hervey, sanitary supervisor of the district, and to the complainant.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *September* 2, 1920

Copies of this report were sent on September 9, 1920, to the local board of health, to the sanitary supervisor, to the complainant, and to the Beakes Dairy, Inc.

In addition to the above, inspections were made and reports transmitted to the local authorities, or advice given through correspondence, in cases of stream pollution at the following places: Arkville, Cedarville, DeRuyter, Easthampton, Jefferson, Jordanville, Liberty (town), Lisha Kill, Naples, New Baltimore (town), New Berlin, Niagara River, North Tonawanda, Port Chester, Watervliet, and Wayland.

INVESTIGATION OF PUBLIC NUISANCES NOT ARISING FROM STREAM POLLUTION

INVESTIGATION OF PUBLIC NUISANCES NOT ARISING FROM STREAM POLLUTION

The Public Health Law definitely places the abatement of public nuisances within the jurisdiction of local boards of health, and chapter VI of the State Sanitary Code, established by the Public Health Council, clearly defines and specifies the procedure to be followed in such cases. However, public nuisances often have a widespread effect or may require in their adjustment special knowledge of a technical nature.

The assistance of the State Department of Health is therefore often requested in such cases, and in some instances direct complaint is made to it by persons concerned. Whenever it is necessary for a proper understanding of the case, a thorough investigation is made of the conditions, upon which are based recommendations and advice to the local boards of health in regard to the proper steps to be taken to abate the conditions of nuisance. In other cases it is possible to show the proper course through correspondence alone.

The reports of the more important cases which have come before the Department of Health during 1920 are given below, and a list of other cases is appended.

CLAYTON

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report upon an investigation of alleged conditions of nuisance caused by the emission of smoke from the pumping station of the Clayton waterworks and from the Thousand Island Laundry, in the village of Clayton, made as a result of a complaint and petition signed by some 32 residents of Clayton, submitted to this Department by the local health officer at the request of the complainants. Briefly stated, the substance of the complaint is that the people living in the vicinity of the pumping station and the laundry are unable to open their windows for ventilation, except when there is a south wind, and that the smoke and soot from these establishments make it necessary for the people to rewash their clothes frequently.

The investigation was made on November 21, 1919, by Mr. A. I. Howd, inspecting engineer in this Department, in company with Dr. H. J. Frame, health officer of the village of Clayton. The pumping station, the laundry, and their surroundings were carefully investigated. Several complainants were interviewed with reference to the alleged nuisance.

The incorporated village of Clayton, which has a population of approximately 1,900, is located in the northwestern part of Jefferson county, in the town of Clayton. It is the western terminal of the Philadelphia and

Clayton branch of the New York Central railroad. The pumping station and the Thousand Island Laundry are located on Water street, in the northern part of the village, in a closely built-up residential and business section.

The pumping station of the Clayton waterworks is owned by the village of Clayton, of which Mr. M. A. Marble is president. The public water supply is derived from the St. Lawrence river, subjected to sterilization with liquid chlorine, and pumped directly into the mains. The pumps are operated approximately 7 hours daily. In addition to the pumps, the equipment of the station includes one Babcock and Wilcox 75-h.p. water tube boiler, having a grate area of 19½ square feet, and a 100-h.p. horizontal tubular boiler manufactured by the Gem City Boiler Company, having a firebox 5½ feet by 6 feet. A 32-inch stack rises to a height of about 30 feet above the roof of the building, or about 65 feet above the elevation of the ground. Coal is fed onto the fire manually at intervals of 15 to 30 minutes. About 1 ton of bituminous coal is used daily.

The following observations were made with reference to the emission of smoke from the plant: When coal was thrown on the fire a dense black smoke issued from the stack, which gradually decreased in intensity to a light smoke which became nearly invisible in about 20 minutes. A strong south wind was blowing at the time of the inspection, which carried the smoke out over the river in the opposite direction from the complainants' properties, and apparently for a distance of 1,000 feet or more before it became sufficiently dispersed and diluted to be invisible. If the wind had been blowing in the other direction, the smoke would undoubtedly have created conditions of public nuisance.

The Thousand Island Laundry, of which Mr. T. E. Flynn is owner, has been at its present location for over 5 years, engaged in complete laundry work, including washing, drying, and ironing. At the time of the inspection there were 3 employees and the plant was being operated 4 days per week. During the three summer months the laundry is operated daily for 9 hours per day and employs from 10 to 14 people.

The plant is equipped with a horizontal tubular boiler having a 36-inch by 36-inch grate, manufactured by James Leffell and Company, Springfield, O. A 15-inch stack rises to a height of 25 feet above the top of the boiler, or 35 feet to 40 feet above the ground. Bituminous coal is fed onto the fire manually at intervals of 15 to 45 minutes. About 1 ton of coal is used per week during the winter. Mr. Flynn stated that prior to a year ago he had used hard coal for firing purposes, but owing to the large increase in cost of hard coal it became necessary for him to use soft coal. When coal was thrown on the fire a dense smoke issued from the stack, which gradually decreased in intensity for 10 to 15 minutes when it became practically invisible. At the time of the inspection the wind was blowing the smoke out over the river from the complainants' properties. If the wind had been blowing from the opposite direction, it is probable that objectionable conditions would have been created affecting a considerable number of people.

As noted above, the pumping station and laundry are located on Water street, in a closely built-up business and residential section of the village. More than a score of houses within 500 feet to 1,000 feet of the plants may be directly affected by the objectionable conditions.

It was alleged by the complainants who were interviewed that when the wind blows in the direction of their houses it is necessary for them to keep the windows of their houses closed owing to the large volumes of smoke; that the smoke and soot get on their houses and porches; and that the conditions created by the operations of these plants impair their health.

Our engineer was informed at the time of the inspection that there are other plants in the village which burn soft coal. It would seem advisable therefore for the village authorities to enact a smoke ordinance to cover all cases in the village.

As a result of this investigation the following conclusions may be drawn:

1. That the use of soft coal for firing purposes at the Clayton waterworks pumping station and at the Thousand Island Laundry under the present methods and conditions causes smoke and soot to escape into the atmosphere in such quantities as to create conditions of public nuisance.

2. That there are other plants in the village of Clayton burning soft coal which were not included or mentioned in the original complaint to this Department.

I therefore recommend:

1. That the village authorities of Clayton be advised to take immediate action to prevent the escape of smoke and soot from the village waterworks pumping station and from the Thousand Island Laundry into the atmosphere in such quantities or in such a manner as to create a public nuisance.

2. That in order to cover all plants or buildings discharging large quantities of smoke into the atmosphere, the village authorities be advised to enact a smoke ordinance, limiting the amount and density of smoke issuing from plants and buildings in the village.

I also recommend that copies of this report be sent to the local board of health, to the sanitary supervisor of the district, to the village authorities, and to the Thousand Island Laundry.

Respectfully submitted

THEODORE HORTON

Chief Engineer

ALBANY, N. Y., *January* 16, 1920

In accordance with the above recommendations, copies of this report were sent on January 16, 1920, to the local board of health, to the sanitary supervisor, to the village authorities and to the Thousand Island Laundry.

NEWARK (Commonwealth Chemical Corporation)

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on a reinspection of the plant of the Commonwealth Chemical Corporation at Newark, made at your direction and as the result of further complaint of the objectionable conditions caused by the emanation of odors from the chemical works of this company.

The inspection was made by Mr. C. A. Holmquist, principal assistant engineer of this Department, in company with Dr. H. A. Wiedrich, acting health officer of the village, and Mr. K. V. Stockelbach, manager of the chemical works, on April 9, 1920. The institution authorities and a number of residents living in the vicinity of the plant were also interviewed. Previous inspections of this plant were made by representatives of this Department, as the result of complaints from the village, on July 16, 1917; September 16, 1917; January 25, 1918; August 3, 1918; and September 25, 1918. The findings and results of these inspections are covered in reports and memoranda which have been prepared and transmitted and will therefore not be reviewed at this time.

As noted in a previous report, the chemical works of this company, which has been in operation since November, 1916, is located in a developed section of the village, immediately west of the Newark State School, formerly the Newark State Custodial Asylum. The hospital and the infirmary of this institution is within 500 feet of the plant, and most of the other buildings, including the residences of the superintendent and the steward, are within from 1,000 to 1,500 feet of the works.

The principal products of the works at this time are benzoic acid, benzoate of soda, benzaldehyde, and coumarin. Toluol, chlorine gas, hydrochloric acid,

sulphuric acid, lime, glacial acetic acid, powdered aldehyde, and bicarbonate of soda are the principal chemicals used in their manufacture. Benzol alcohol, malachite green, and iraline were formerly produced, but the making of these products has now been discontinued. The daily output of the works has increased greatly since 1916, and the production of benzoic acid and benzaldehyde, which are the main products, has been increased nearly fourfold since the time of the last inspection in 1918. Whereas only a few men were employed when the plant was first put in operation, from 60 to 70 men are now employed at the works.

It would be impracticable in this report to describe in detail the processes of manufacture of the chemicals produced at present. It might be stated briefly, however, that the principal steps or processes carried out consist of the chlorination of the toluol, distillation, sublimation, boiling, and mixing of the various ingredients and compounds. Whereas odors, gases and vapors, or fumes, are given off from a number of points in the works and from a number of stages in the process of manufacture, the principal odors and gases emanating from the works are from the manufacturing of benzoic acid and benzaldehyde, and consist of odors of bitter almond oil, odors of benzoic acid or dust, and hydrochloric acid, and chlorine gases. Although the bitter almond oil odors permeate the entire works and are strong and pronounced in the plant, and could be distinctly observed and identified at a considerable distance from the works, the hydrochloric acid and chlorine gases were much more objectionable, and produced coughing and an irritating sensation in the throat in and near the works.

A number of devices for the absorption and elimination of these latter gases have been installed and tried out since the works were put in operation. The earlier devices, however, failed to care for these gases due largely to their inadequacy and to the difficulties experienced in disposal of the liquid wastes from the absorption and scrubbing towers. Finally a scrubbing and absorption device consisting of a set of two tourills and a scrubbing tower 3 feet in diameter and 10 feet high designed to operate in series was installed in the summer of 1918. This device seemed to operate satisfactorily, and almost entirely eliminated the escape of hydrochloric acid and chlorine gases when under observation at the time of the previous inspection on September 25, 1918. It appears, however, that the production of benzoic acid and benzaldehyde has increased to such an extent that the amount of hydrochloric acid and chlorine gases liberated in the process of manufacturing greatly exceeded the capacity of this absorption and scrubbing device, and the use of this particular arrangement was abandoned. The company has now installed 11 absorption and scrubbing devices, one for each of the 11 toluol chlorination units. Each of these devices consists of two tourills operated in series. The first tourill is filled with water and the second with earthenware blocks. The gases generated by the chlorination of toluol are passed through the first tourill where most of the hydrochloric acid gas and probably some of the chlorine gas is absorbed by the water. The unabsorbed gases are then passed from the second tourill down through which a stream of water flows for the purpose of absorbing and scrubbing the residual gases. After a certain amount of hydrochloric acid has been absorbed by the water in the first tourill, the resulting solution of the hydrochloric acid is drawn off and used at the works in the process of manufacturing and fresh water is added. The water used in the second tourill is allowed to run to waste to the sewer.

Although the same general principles were embodied in the design of these scrubbing and absorption devices as those used in the scrubber that appeared to operate satisfactorily in 1918, the present devices are defective in many respects and not as effective, and relatively large volumes of hydrochloric acid and chlorine gases were found escaping through leaky joints and connections, from the waste scrubber water, and from the solution of hot hydrochloric acid when drawn from the first tourill at each absorption unit. It is probable also that considerable volumes of gases occasionally escape in the case of breaks in the scrubbers.

It was learned from the manager of the works that material has been ordered for the installation of a number of absorption and scrubbing devices like those in successful operation in 1918, and that it was expected to have these new devices installed and in operation by June 1 of this year. Changes are also being made in the process of making benzoic acid and benzaldehyde which will prevent the escape of benzoic acid into the atmosphere when the hydrochloric acid is added to the tubs of calcium benzoate in the yard of the works, and from the ventilator over the wooden vat where the benzoic acid is melted. Although the odors or dust of benzoic acid were strong in the works near the tubs and vat, they did not appear to carry any considerable distance at the time of the inspection. Odors of acetic acid were also observed in the portions of the works where coumarin is made, but this odor could not be observed outside the premises of the works.

It was claimed by the persons interviewed in the village that the benzaldehyde or bitter almond oil odor could be observed whenever the wind was from the direction of the chemical works, and that occasionally there was an odor of gas from the works that produced coughing and an irritating sensation in the throat. It was also alleged that these odors are sometimes accompanied by a fog-like appearance of the atmosphere. These conditions are probably produced by the escape of hydrochloric acid and chlorine gases from the works.

In conclusion, I would state that it was found from the recent inspection that the production of chemicals at the Newark works of the Commonwealth Chemical Corporation has increased greatly since the time of the last inspection in 1918, and that the installation of scrubbers and absorption devices for preventing the escape of odors and gases of the works has not kept pace with the growth of the works. The existing devices for the absorption and scrubbing of hydrochloric acid and chlorine gases escaping from chlorinating toluol are not efficient nor do they effectively prevent the escape of these gases into the atmosphere. Furthermore, no effective steps have been taken to prevent the escape of bitter almond oil odor and the acetic acid odor. The result of the escape of gases, dust, and odors from the various portions of the chemical works produces a serious public nuisance which affects not only the Newark State School located in close proximity to the works but also a large portion of the village in the neighborhood. It was found, however, that modifications in construction and operation were in progress which would probably in large measures prevent or at least reduce the escape of benzoic acid into the atmosphere. Furthermore, material had been ordered for the installation of more effective absorption and scrubbing devices designed to prevent the escape of hydrochloric acid and chlorine gases, and it is probable that these devices will reduce, if not wholly eliminate, the escape of these objectionable gases from the works. Steps should also be taken by the company to reduce or prevent as far as possible the escape of benzaldehyde or bitter almond oil odors and the acetic acid odors or gases from the works possibly by the installation of a system of hoods and scrubbers and by more careful operation.

In view of the above and after careful consideration of the matter, I would make the following recommendations:

1. That the Commonwealth Chemical Corporation be notified to take immediate steps effectively to eliminate the escape of odors and gases from its chemical works at Newark.
2. That if the public nuisance now created by the escape of odors and gases from the chemical works is not effectively abated within a reasonable length of time, action be taken by you to have the nuisance abated in accordance with the provisions of the Public Health Law.

I would further recommend that copies of this report be transmitted to the Commonwealth Chemical Corporation and to the local board of health.

Respectfully submitted

THEODORE HORTON

Chief Engineer

ALBANY, N. Y., *April* 13, 1920

In accordance with the above recommendations, copies of this report were sent on April 20, 1920, to the local board of health and to the Commonwealth Chemical Corporation.

On November 11, 1920, further complaint was made regarding conditions of nuisance created by the operation of the factory and on November 17, 1920, a reinspection of the plant was made. Certain improvements had been made to reduce the amount of odors escaping from the plant, but due to improper operation fumes and gases escaped from the factory at times in considerable quantities.

OSSINING

HERMANN M. BIGGS, M. D., *State Commissioner of Health:*

I beg to submit the following report on an investigation of the objectionable conditions created by the maintenance of a refuse dump in the village of Ossining, which was made the subject of a complaint to this Department. The investigation was made on November 16, 1920, by Mr. A. I. Howd, assistant engineer in this Department, accompanied by Dr. Robert T. Irvine, health officer of the village of Ossining. People living in the vicinity of the dump were interviewed, and the dump and its surroundings were carefully inspected.

The garbage and refuse in Ossining is collected by contract for the village. The contractor, Mr. Luke F. Lyons, had one wagon having a capacity of 2 to 3 yards, and an auto truck having a capacity of about 2 yards, which were used in making collections of ashes and rubbish through the village. No restriction is made by the village, according to the local health ordinances, in regard to the kind of receptacles to be used for the receiving of garbage and refuse except that they shall hold the matter "without leakage." The garbage is collected separately, and the ashes and rubbish are collected combined. The garbage is taken outside the village and disposed of, while the ashes and rubbish are dumped at sites in the village approved by the local board of health.

The dump which was made the subject of the complaint to this Department is located in the southern part of the village adjacent to Washington and South Highland avenues. This site was chosen with the permission of the local board of health for the purpose of filling in a small ravine adjoining a baseball park. Rubbish and ashes have been dumped at this site for the past two years. The dump extends parallel to Washington avenue for 150 to 200 feet and is some 20 feet deep. About 15 loads of ashes and rubbish are dumped at this site daily. As soon as the dump reaches the proper elevation it is covered with earth. It was cold and rainy on the day of the inspection but the odor of decomposing garbage could be detected at times when on the dump. The dump is located in a good residential section of the village. There are 4 or 5 houses within 200 feet of the dump, and about 12 within 400 feet of it.

At the time of the inspection the dump consisted of ashes, rubbish, papers, some garbage and other matter. It was learned that frequently people mixed garbage with the ashes. Article 43 of the Health Ordinances of the village of Ossining reads in part as follows: "No persons shall place together, mix, or have in the same receptacle, ashes and garbage. Violation of any of the provisions of this ordinance shall subject the offending person to a penalty of ten dollars." It is evident from the inspection that this ordinance is not being strictly enforced by the village authorities. The dump is located in such proximity to a residential section of the village that it is practically impossible to maintain the dump without creating conditions of nuisance, if garbage and tin cans containing vegetable and organic matter are allowed to be mixed with the ashes and rubbish and allowed to remain exposed on the dump. Unless garbage and all other matter containing organic or vegetable substances are excluded from the dump, the local board of health should require the discontinuance of the use of this dump between April 1 and

November 1, and only approve of a site well removed from a residential section so that no conditions of nuisance may be created.

A new contract for the removal of ashes, household refuse, and garbage in the village of Ossining was let to Mr. Isaac Kamm for a period of five years beginning November 21, 1920. According to the specifications of the contract, the village will provide a dumping ground for the disposal of all ashes and household refuse collected under the contract, and the contractor will provide and maintain a dumping ground outside of the village limits for the disposal of all garbage.

In view of the above facts the following conclusions may be drawn:

1. That the refuse dump concerning which complaint was made to this Department is located in a residential section of the village of Ossining in close proximity to a number of houses.
2. That the dumping of garbage and other odoriferous matter with the ashes causes objectionable conditions.
3. That no conditions of nuisance existed at the time of the inspection owing undoubtedly to the cold rainy weather, but during the summer under certain atmospheric conditions a nuisance might be created.

I therefore recommend:

1. That the local board of health require that the dump, in view of its location, be maintained in a condition free from objection at all times.
2. That the village authorities strictly enforce article 43 of the Health Ordinances, which requires that no person shall place together, mix, or have in the same receptacle, ashes and garbage.
3. That if it is found to be impossible to maintain a complete separation of ashes and garbage, the local board of health require the discontinuance of the use of the dump at Washington and South Highland avenues between April 1 and November 1, and a site be chosen well removed from a residential section so that no conditions of nuisance may be created.

I further recommend that copies of this report be sent to the local board of health, to the sanitary supervisor of the district, and to the complainants.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *December* 1, 1920 *Chief Engineer*

In accordance with the above recommendations, copies of the report were sent on December 1, 1920, to the sanitary supervisor, to the village president, the local board of health of Ossining and to the complainants.

PELHAM (Knickerbocker Ice Company)

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on an inspection of the plant of the Knickerbocker Ice Company, Inc., of Pelham, N. Y., made upon complaint to this Department that the manufactured ice contained considerable dirt and other foreign material. The inspection was made by Mr. N. H. Baier, sanitary inspector in this Department, on August 13, 1920, accompanied by Dr. E. S. Newell, health officer of Pelham, and Mr. Richard Handibode, chief engineer of the Pelham ice plant. A number of persons who were users of the ice were also interviewed.

The Pelham plant of the Knickerbocker Ice Company, Inc., is located in the western part of the village of Pelham, near the New York, New Haven and Hartford railroad and the city line of Mount Vernon. The main office of the company is at 1480 Broadway, New York city.

The manufacture of ice was begun in 1918, and is carried on from April to December of each year. There are 28 men employed in three shifts. The water supply of the plant is derived from two sources — for condensing purposes, which requires about 50,000 gallons daily, the water is obtained from a well near the plant; the water for the making of the ice, which requires

40,000 gallons daily, is obtained from the New York Inter-Urban Water Company. The daily output is 135 tons of ice, sold in Pelham, New Rochelle, and Mount Vernon, either directly or through independent dealers. Practically no ice is stored, the ice being sold as soon as it is manufactured.

A brief description of the machinery used will be given and the method of manufacturing of the ice outlined. On the main floor are the Frick Compound ice machines, which include a steam engine and compressor, and also a steam condenser, skimmer, and reboiler. On the second floor are a small freezing tank and ice storage room. On the third floor are the larger freezing tank, ammonia condenser, and charcoal filters. The process employed is the can system, using the ammonia compression system for freezing.

The ammonia compression process is essentially as follows: The compressed ammonia gas first passes to an oil cooler, the oil being retained in the oil separator, and the gas, after being liquefied in the ammonia condenser, passes into the separating tank. From this tank the liquid is fed as required into the coils of the freezing tank, where expansion takes place, thence passing again in the form of gas to the compressor.

Well water is used to cool the ammonia condenser. This water is pumped from a well near the plant to a water storage tank. From this tank the water flows by gravity through a network of pipes over the ammonia condensers and discharges onto the concrete floor under the condensers. From the concrete floor the condenser water which has been heated in passing over the condensers flows to pipes leading to an 8-inch steel pipe which discharges into the Hutchinson river.

The water of the village water supply is used in the boiler to generate steam for driving the steam engine. The exhaust steam from the engine then passes to the steam condenser where condensation takes place, thence to the skimmer, where any oil that may have passed through with the steam is removed. The water resulting from the condensed steam passes to the reboiler where distillation takes place. It then passes through the cooling coil, thence to the charcoal filters, of which there are 8, each being 4 feet in diameter and 7 feet deep. From these filters the water passes to the cold water storage tank which feeds the cans in the freezing tank.

There are two freezing tanks, one of 900, the other of 700 can capacity. They are made of galvanized iron and contain the direct expansion freezing coils equally distributed throughout the tank. These coils are submerged in brine, consisting of a solution of common salt maintained at a temperature of 14° F. The tanks are provided with 4 agitators, to keep the brine in motion. The capacity of each can in 300 pounds, approximately 42 hours being necessary for freezing. Each can is covered with a wooden board 2½ feet by 1½ feet by 2 inches thick.

In filling the ice cans a so-called float filler is used. This filler is carried by an employee to the can to be filled, the tube placed into the can, and then a valve lifted which automatically fills the can to the desired depth.

The ice is harvested from the tanks by means of a one-ton electric hoist on a traveling crane. The hoist removes 3 cans at a time, delivers them to the thawing tank which is of galvanized iron, which contains well water heated by steam, and is just large enough to hold the 3 cans. The cans are immersed in the tank for 5 minutes, the ice then removed, placed on dumping boards, slid to an elevator operated by a compressed air piston lift, and carried to the ice storage room.

At the time of inspection there was considerable ice in the storage room. An examination of these blocks failed to disclose any appreciable amount of foreign matter in the ice. There were a few blocks, however, which contained brown or black spots near the edges of the blocks. Each cake had a white core, due presumably to the entrained air in filling the cans from the top, the air being concentrated at the center of the block as the water freezes inward.

From the investigation made, there appeared a number of places which would permit the entrance of dirt or other foreign material. The first is from the individual wooden covers over the ice cans. These covers, as placed together, leave small openings through which dirt from workmen's boots may

be easily washed and carried into the cans. A number of the covers were lifted and the cans as well as the half-frozen water examined. The inside of a few of the cans were dirty and rusty, while the water which was not as yet frozen contained small red particles, evidently iron rust.

The thawing tank as well as the water in it was very dirty. The galvanized iron was coated with a thick, slimy, red rust. In placing the cans into the tank for thawing, the water might easily overflow the can under the present arrangement. In this way not only the ice but the can itself would become dirty. Mr. Handibode stated that when this happens the can is washed before it is again used. The cans are ordinarily washed only once a year.

In view of the above facts the following conclusions may be drawn:

1. That dirt from workmen's boots can easily gain access to the water in the ice cans in the freezing tank through the openings between the boards covering the cans.
2. That the water in the thawing tank contains considerable dirt and iron and that these impurities may be transferred to the ice.
3. That the cans in which the ice is frozen may become coated with rust and dirt from the water in the thawing tank.

I therefore recommend:

1. That there be a small anteroom near the freezing rooms, where the workmen should be required to clean their boots thoroughly before entering, and that the floor of this room be concreted and properly drained.
2. That the water in the thawing tank be refilled with clean water at least once a day.
3. That the thawing tank be thoroughly cleaned at least once a day.
4. That the ice cans be cleaned after each freezing.
5. That the charcoal filters be washed out regularly.

I further recommend that copies of this report be sent to the local board of health, to the sanitary supervisor, to the Knickerbocker Ice Company, Inc., and to Dr. LeRoy E. Hubbard.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *August* 20, 1920

Copies of this report were sent on August 25, 1920, to the Knickerbocker Ice Company, Inc., to the sanitary supervisor, and to the local board of health. On September 1, 1920, a communication was received from Knickerbocker Ice Company, Inc., stating that the recommendations would be carried out so far as practicable so to do.

PELHAM (Westchester Chemical Company)

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report upon an investigation of an alleged nuisance caused by the operation of the chemical works of the Westchester Chemical Company at Pelham, Westchester county, N. Y., which was made the subject of a complaint to this Department. Briefly stated the substance of the complaint is that the odor coming from the direction of the works is so disagreeable that it makes children sick and causes them to vomit.

The chemical works, its surroundings, and the methods of operation were carfully inspected; and the superintendent of the plant, the local health officer, and people living in the vicinity were interviewed. The investigation was made on June 15, 1920, by Mr. A. I. Howd, assistant engineer in this Department, accompanied by Mr. C. F. Hobson, superintendent of the works of the Westchester Chemical Company.

The works of the Westchester Chemical Company, of which Mr. Theodore Haebler is president, are located in the western part of the village of Pelham,

near the New York, New Haven and Hartford Railroad and the city line of Mount Vernon. A number of fine residences are located within seven hundred feet of the plant. The works have been in operation at the present location since June 15, 1918, employing about 11 men.

The Westchester Chemical Company is engaged in the manufacture of lactic acid from sugar by the fermentation process. The process of manufacture is briefly as follows: A sugar solution is formed by blowing steam into a mixture of starch, sulphuric acid, and water, and stirring for 2 hours. The solution is then pumped into wooden ferment tanks, lime added and the mixture allowed to remain in the tanks for 7 days. Butyric acid is formed at this point of the process, but at the time of the inspection practically no trace of the odor could be detected in the room in which the tanks were located. After fermentation the turbid liquid resulting is passed through a closed filter to clarify it. From the filter the liquid flows into a tank from which it is pumped to two decomposing tanks where sulphuric acid is added to precipitate the lime. Here it is stirred for about 15 minutes while the sulphuric acid is being added, and then allowed to stand for about 12 hours for the calcium sulphate to settle out. The liquid at this point usually contains less than 9 per cent of lactic acid. After this settlement the liquid is conducted to a vacuum pan where it is heated and then discharged into a tank for the further settlement of the calcium sulphate. It is then sucked back into the vacuum pan and evaporated to the desired concentration. The acid after this concentration is run into barreling tanks and barreled.

Two points were observed in the process of manufacture where odors might be given off. The first point is the two decomposing tanks where odors might escape when the liquid is being stirred while adding the sulphuric acid, and while it is allowed to stand uncovered for 12 hours while the calcium sulphate is settling out. Secondly, odors and vapors are given off when the acid is being heated and evaporated to the proper concentration in the vacuum pan.

The decomposing tanks are cylindrical in shape, constructed of wood, and are not provided with covers. The tops of the tanks are at an elevation of a few feet below the concrete roof of the building. In the room there is but one small window, which at the time of the inspection was open. There are two distinct odors apparently arising from the tanks, one a sharp acetic acid odor and the other a nauseating butyric acid odor. These odors could not be definitely detected in the adjoining room of the building. If tight covers were provided for these tanks, the volume of the odors that escape from these sources might be considerably reduced.

The odors and vapors given off from the vacuum pan escape through an 18-inch outlet pipe. A 3-inch pipe filled with numerous small holes is located in the center of this outlet, and water is sprayed continuously from this pipe when the vacuum pan is being operated, to condense the vapors in the 18-inch outlet pipe thus reducing the possibility of the escape of odors. At the time of the inspection the waste water was being discharged into the public sewer system. It was estimated that about 100,000 to 150,000 gallons of water per day are used in this scrubber. The water is obtained from driven wells.

Ordinarily the waste water is not discharged into the sewer system, but pumped to spray nozzles on the roof of a portion of the building, a water-proof brick wall preventing it from flowing off the roof. The water is kept alkaline by adding lime to it, which should in a large measure prevent the emanation of objectionable odors. The water after aeration is again used in the scrubber. Since the spray nozzles on the roof were not in operation at the time of the inspection no definite statement can be made regarding the emanation of odors from this point. About the 10th of May of this year the wall on the roof gave way allowing the water to run off onto ground. It was stated that at that time the water may have evaporated and given off offensive odors. The new wall had just been completed at the time of the inspection and was to be put in use the following day.

At the time of the inspection no offensive or objectionable odors could be detected outside the chemical works. During the past year the local board

of health of the village of Pelham has received but 3 complaints in regard to odors from the Westchester Chemical Company, all of which were made about the time and shortly after the roof wall gave way which held back the water from the scrubber. The local board of health of the City of Mount Vernon reports numerous complaints with reference to odors from the chemical works.

The superintendent of the works, Mr. Hobson, stated that the company was willing to do anything possible to prevent the escape of offensive and objectionable odors from the plant. The men working at the plant have become practically immune to the odors and it is difficult for them to detect them. Mr. Hobson further stated that he desired to have people living in the vicinity inform him of the nature of the odors and the time when they detect them escaping so that he may know at just what points of the process the escape of odors is noticed. Effective action might then be taken to prevent a re-occurrence of their escape.

In view of the above facts the following conclusions may be drawn:

1. That objectionable odors may escape from the decomposing tank when the liquid is being stirred while adding sulphuric acid, and when the liquid is in a quiescent state allowing the sulphate of lime to settle out.
2. That objectionable odors and vapors might escape from vacuum pan if scrubber is not operated continuously.
3. That the plant of the Westchester Chemical Company is located in a fine residential section, and unless the plant is carefully operated, conditions of nuisance may be created.

I therefore recommend:

1. That the Westchester Chemical Company be advised to consider the matter of providing tight covers for the decomposing tank to prevent the escape of odors from these tanks.
2. That the scrubber used in connection with the vacuum pan be operated without interruption at all times when vacuum pan is being used.
3. That the works of the Westchester Chemical Company be carefully operated at all times and that every precaution be taken by the authorities in charge of the plant to prevent the escape of odors and vapors in such a manner as to create a nuisance.
4. That the local boards of health of the village of Pelham and the city of Mount Vernon cooperate with the Westchester Chemical Company and immediately notify them of any escape of odors from the plant.

I further recommend that copies of this report be sent to local boards of health of the village of Pelham and City of Mount Vernon, to the sanitary supervisor of the district, and to the Westchester Chemical Company.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *July* 3, 1920

Copies of this report were sent on July 6, 1920, to the local board of health, to the sanitary supervisor, and to the Westchester Chemical Company.

POUGHKEEPSIE (Town) Knauss Brothers

HERMANN M. BIGGS, M. D., *State Commissioner of Health:*

I beg to submit the following report upon an investigation of alleged objectionable conditions caused by the operation of and disposal of wastes from the abattoir of Knauss Brothers, in the town of Poughkeepsie, Dutchess county, N. Y. The investigation was made on October 28, 1920, by Mr. A. I. Howd, assistant engineer in this department, accompanied by the health officer of the town of Poughkeepsie, as a result of the complaint of objec-

tionable odors and offensive conditions created by the operation of this plant, and at the request of the local board of health of the town of Poughkeepsie.

The abattoir or slaughter house of Knauss Brothers is located in the town of Poughkeepsie about one and one-half miles north of the city of Poughkeepsie. The abattoir was constructed during 1919 and 1920, and was put in operation in April, 1920. The plant is engaged in the slaughtering of pigs and beef and the rendering of the entrails and waste products of the animals. At the time of the inspection a maximum of 150 pigs and 25 beefs were slaughtered weekly. The plant has a capacity of about double this amount. The slaughtering is done about once or twice a week and the wastes are rendered once or twick a week.

The method of rendering the wastes is briefly as follows: The waste products from the slaughtering of the animals are put into a digester of the Wannenwetsch type and cooked for 4 or 5 hours by live steam at 40 pounds pressure. The grease is then drawn off into a closed storage tank and the water is discharged into a cesspool. The tankage is agitated and dried simultaneously with steam which is applied to the steam jacket surrounding the bottom of the digester. The vapors and gases generated during the processes of rendering are conveyed through a pipe to a vacuum pump and jet condenser and discharged into the cesspool referred to above. No estimate could be obtained as to the amount of water used in the condenser.

The waste water and condensing water resulting from the rendering process are discharged through a 6-inch pipe to the cesspool located a short distance north of the plant. The cesspool which is 10 feet in diameter and 10 feet deep is loosely stoned up and is provided with a concrete cover. When first put into use the cesspool operated satisfactorily for a short time. The cesspool then filled up and an overflow pipe line was run to a pond or swamp about 150 feet north of the cesspool. When complaint was made concerning the objectionable conditions created by overflow of the cesspool, two large trenches were constructed, filled with rocks and then covered with earth. The overflow from the cesspool was then diverted into these trenches. At the time of the inspection the wastes were flowing out into the swamp from the end of the trenches.

The pond or swamp receiving the overflow from the trenches is roughly some 150 feet in diameter, and was formed by the construction of a railroad embankment across a low depression which was the natural course of drainage for a relatively small area in the vicinity of the abattoir. The construction of the railroad embankment some years ago caused the runoff from this area to back up and form a marsh which contains water most of the year. This condition has become more aggravated during the past six months by the discharge of wastes from the abattoir. At the time of the inspection a light scum was noticeable on portions of the swamp and an objectionable odor could be detected in the immediate vicinity. No odor could be detected a few hundred feet from the swamp but the conditions were unsightly. It seems, therefore, that while objectionable conditions were created, at the time of the inspection no conditions of public nuisance existed. It should be remembered that it was cool on the day of the inspection and there was practically no wind. During warm weather under certain atmospheric conditions it seems that conditions of nuisance would probably be created. The discharge of wastes from the abattoir also without a permit from this Department is a direct violation of Article V of the Public Health Law.

Pilgrim Hall, a reception building of the Hudson River State Hospital, is situated about three-forths of a mile north of the abattoir and the swamp. It was stated by hospital authorities that the odor emanaging from the abattoir and swamp is very objectionable to the patients at the hospital. Complaint was also made concerning the extraordinary prevalence of mosquitoes and flies at the hospital. There are also several residence located within a half mile east and south of the plant which might be affected by any nuisance resulting from the operation of the abattoir.

There are evidently three classes of wastes to be disposed of from the abattoir. The first class consists of the condensing water which includes the

condensed vapors and gases generated in the processes of rendering. The water generally is practically free from any solid or suspended matter but may give off a slight odor. This class of wastes might be discharged into a stream or watercourse without creating objectionable conditions. Although no figures could be obtained as to the amount of the wastes, they are known to be relatively large. The second class of wastes consists of the water which is drawn off from the digester after the process of rendering. This water may contain particles of grease, tankage, and other solid and suspended matter, and should therefore be passed through a settling tank having a capacity sufficient to provide a detention of the wastes of 8 or 10 hours, and the effluent treated by some method of filtration. The effluent from the filter beds might be discharged into a stream or watercourse together with the condensing water. This class of wastes is relatively small. The third class of wastes consists of washings from floors and apparatus and may contain small amounts of blood, scraps, dirt, and other solid matter which might find its way to the floors of the plant. In view of the nature of this class of wastes they should be discharged, together with the water from the digester, into a settling tank.

In view of the many features involved in the proper disposal of the wastes, a competent engineer should be employed by the owners of the abattoir to prepare plans for the treatment and disposal of wastes from their plant in the town of Poughkeepsie. These plans when prepared should be submitted to and receive the approval of this Department, in accordance with the provisions of the Public Health Law.

In view of the above facts the following conclusions may be drawn:

1. That the construction of a railroad embankment without a culvert across a natural drainage course a short distance north of the abattoir of Knauss Brothers, in the town of Poughkeepsie, causes surface and ground water to accumulate and create marshy and objectionable conditions.

2. That the above conditions become more aggravated by the discharge of wastes from Knauss Brothers' abattoir into the marshy area.

3. That objectionable conditions were created at the time of the inspection, and conditions of nuisance would probably exist during warm weather under certain atmospheric conditions.

4. That the discharge of wastes from this abattoir without a permit is a direct violation of Article V of the Public Health Law.

5. That the abattoir was maintained in a fairly cleanly condition at the time of the inspection.

I therefore recommend:

1. That the local board of health of the town of Poughkeepsie require the proper authorities to take action to relieve the swampy and objectionable conditions created by the construction of a railroad embankment across a natural drainage course in the town of Poughkeepsie near the abattoir of Knauss Brothers, either by the construction of a culvert under the railroad at the proper point or by some other satisfactory method.

2. That Knauss Brothers take immediate steps to discontinue the discharge of untreated wastes from their plant, and employ a competent engineer to prepare plans for the treatment and disposal of wastes from their abattoir in the town of Poughkeepsie, and that the plans when completed be submitted to this Department for approval, together with an application for a permit, in accordance with the provisions of Article V of the Public Health Law.

I further recommend that copies of this report be sent to the local board of health of the town of Poughkeepsie, to the sanitary supervisor of the district, to Knauss Brothers, and to the Superintendent of the Hudson River State Hospital.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *November* 12, 1920 *Chief Engineer*

Copies of this report were sent on November 15, 1920, to the local board of health, to the sanitary supervisor, to the complainant, and to Knauss Brothers. On November 30, 1920, a communication was received from Knauss Brothers, in which it was stated that an engineer had been employed to prepare plans for the treatment and disposal of wastes from the abattoir and that steps had been taken to drain the swamp.

ROME (Rome Gas, Electric Light and Power Company)

HERMANN M. BIGGS, M. D., *State Commissioner of Health:*

I beg to submit the following report upon an investigation of alleged objectionable conditions arising from the use of the gas of the Rome Gas, Electric Light and Power Company, of Rome, N. Y., which inspection was made at the request of Dr. C. R. Mahady, health officer of the City of Rome, who had received numerous complaints from the users of the gas that disagreeable and at times unendurable odors of sulphur and its compounds were given off in the use of this gas for either heating or illuminating purposes.

The inspection of the gas plant was made by Mr. N. H. Baier, sanitary inspector in this Department, on September 2, 1920, accompanied by Mr. A. B. Morton, manager of the company. Dr. C. R. Mahady, health officer, and Dr. H. B. White, member of the local board of health, and Mr. G. A. Mickle, Mayor of the city of Rome, were interviewed.

The Rome Gas, Electric Light and Power company is engaged in the manufacture of coal gas and water gas. In the manufacture of coal gas the byproducts are coke, tar, and ammonia. The process of manufacture is briefly as follows: Bituminous coal is subjected to destructive distillation in inclined retorts, arranged in 6 benches, with 5 retorts to a bench. The coal is heated for 6 hours, at the end of which time the coke is discharged by gravity to bins and quenched, put on cars which carry the coke to an elevator, and conveyed to the coke shed. The gases given off in the combustion or distillation of the coal pass through an opening at the lower end of the retort to a vetical castiron pipe or standpipe leading to a rectangular box or water seal, which serves one bench. In the water seal, the greater part of the tar and oily products condense and collect under the water. The gases then pass to the primary condenser, which consists of a system of tubes surrounded by flowing water, where the temperature of the gas is reduced in passing through the tubes from 150°F. to 105°F. A so-called exhauster draws the gas from the retort through the water seal and primary condenser, and pumps it through the remaining parts of the plant. The tar extractor further purifies the gas. It then passes through the scrubber and washer to remove the ammonia and part of the carbon dioxide and hydrogen sulphide. The gas then passes through a secondary condenser and rotary scrubber, thence to the purifier, composed of layers of hydrated ferric oxide, to remove the sulphur compounds. The gas is in contact with this purifying material for from 4 to 6 minutes. The purified gas then passes through a station meter, and finally to a holder.

The manufacture of water gas is briefly as follows: Coke is placed in a generator, which consists of a steel cylindrical shell 6 feet 6 inches in diameter and 9 feet high, lined with firebrick. The coke in the generator is intermittently brought to incandescence by a blast of air. Each charge of coke is fired 5 times, with 5 minutes to a blast. The gases from the generator enter at the top of the carburetter, a second steel cylindrical shell lined with firebrick and containing a firebrick checkerwork. In passing down through the carburetter the producer gas from the generator is partly burned by an air blast which enters the apparatus near the top, heating the checkerwork white hot. The gases then pass to the superheater, a taller chamber, similarly filled with checkerwork. When both the carburetter and the superheater have reached the desired temperature, the air blasts are cut off and steam is introduced into the generator. The water gas thus formed passes to the carburetter while a small stream of oil is being introduced through a pipe at

the top. The oil, called "gas oil," which is a third distillation of crude oil, is applied for about 5 minutes. The lower end of the pipe leading from the superheater is closed by a round wash water seal to prevent the return of the gas to the apparatus. From the water seal the gas passes to the scrubber, where the first operation of cleansing and purification takes place. The exhauster then draws the gas through the condenser to condense the gas properly, through the wash box, and thence to the purifiers, which contain layers of iron oxide, similar to those for the purification of the coal gas. The gas from the water gas meter and the gas from the coal gas meter then enter the holder, where the two gases combine before being delivered to the street mains.

The capacity of the plant is 500,000 cubic feet of coal gas and 350,000 cubic feet of water gas per day. The average amount of gas supplied per day is from 450,000 to 500,000 cubic feet. As delivered to the consumer, the gas contains about 70 per cent coal gas and 30 per cent water gas.

The only test that is performed at the plant to ascertain the presence of impurities is that for hydrogen sulphide, this test being made at the station meter. The gas is impinged through a pet-cock on a strip of white paper which is moistened with a solution of acetate of lead. The presence of the sulphide is indicated by the discoloration of the paper. The amount of the discoloration depends on the quantity of the sulpherated hydrogen contained in the gas, and the length of time given to the exposure. At the time of inspection the test of the coal gas gave a decided dark brown discoloration almost instantaneously. Although there was considerable variation in this discoloration from one test to another, made but a minute or two apart, each of the tests that were made indicated a high percentage of hydrogen sulphide. The test on the water gas gave but a slight discoloration, showing that it contained only a small amount of the hydrogen sulphide. A good gas coal should preferably have less than 0.7 per cent of sulphur. The gas as delivered to the consumer should have not more than 20 grains of sulphur per 100 cubic feet of gas.

In interviewing the manager of the gas company it was learned that the company had, up to December, 1919, been receiving two grades of good bituminous coal, the West Moreland coal and the Yahegany coal. Since last December, however, the company has been unable to get their usual supply from these sources, and it has been necessary to use whatever coal they could purchase, regardless of the quality of the coal as to its sulphur contents. Under these circumstances the coal that has been purchased contained at times such large amounts of sulphur that the scrubbers and ferric oride purifiers could not remove it.

Beginning with August 27, 1920, when the first complaint about the gas was made to Dr. Mahady, the sulphur in the gas was detected at different times and at different localities. According to the persons interviewed, the amount of sulphur in the gas appeared to have reached a maximun on Sunday, August 29, 1920. It was claimed that the sulphur fumes on this day were so intense that the use of the gas was at times almost an impossibility.

At the time of inspection the gas in a few houses was examined, both as an illuminant and as a fuel. No odor of sulphur was detected except at one moment, when a very marked odor was noted, but this odor lasted only for an instant.

According to a telegram received September 1, 1920, by the Rome Gas, Electric Light and Power Company from the coal company which furnishes the coal, 2 cars of West Moreland coal left the mine on August 31, 1920, and 2 cars will be shipped to Rome daily thereafter. It would seem that the use of this coal for the manufacture of gas should remedy the present unsatisfactory conditions arising from the use of a poor grade of coal.

In view of the above facts the following conclusions may be drawn:

1. That the coal that is at present being used by the Rome Gas, Electric Light and Power Company is unsuitable for the manufacture of coal gas, due to its large sulphur content.

2. That the use of this gas as now manufactured by the Rome Gas, Electric Light and Power Company may at times prove deleterious to the health of the consumers.

3. That the Rome Gas, Electric Light and Power Company is at present attempting to obtain a satisfactory gas coal to remedy the present unsatisfactory conditions existing through the use of a poor grade of coal in the manufacture of gas.

As a result of the inspection and in view of the foregoing I would recommend:

1. That the Rome Gas, Electric Light and Power Company abandon the use of the poor grade of coal as soon as the West Moreland coal or some other satisfactory coal can be obtained.

2. That the Rome Gas, Electric Light and Power Company take the necessary steps to obtain an adequate supply of good gas coal so that congested freight conditions, expiration of present contracts, or similar conditions that would delay or hinder the receipt of the usual supply of good gas coal will not interfere with the production of a gas of satisfactory nature.

3. That the Rome Gas, Electric Light and Power Company have frequent tests made at regular intervals, by an expert industrial chemist, of the coal that is to be used for the manufacture of gas, of the resulting coal gas and water gas, and also tests of the gas as finally delivered to the consumer, to ascertain the percentage of impurities contained therein, with particular reference to the amount of sulphur and its compounds, so that the quality of the gas delivered to the consumer may be more definitely determined.

I would further recommend that copies of this report be sent to the local board of health, to the sanitary supervisor of the district, and to Mr. A. B. Morton, Manager of the Rome Gas, Electric Light and Power Company.

Respectfully submitted

THEODORE HORTON

ALBANY, N. Y., *September* 10, 1920 *Chief Engineer*

Copies of this report were sent on September 20, 1920, to the local board of health, to the sanitary supervisor, and to the Rome Gas, Electric Light and Power Company. On September 25 a communication was received from the company, in which it was stated that the recommendations of the report would be carried out.

SAVANNAH (Shefford Cheese Company, Inc.)

HERMANN M. BIGGS, M. D., *State Commissioner of Health:*

I beg to submit the following report upon an investigation of an alleged nuisance caused by the discharge of wastes from the factory of the Shefford Cheese Company, Inc., at Savannah, Wayne county, N. Y., into a small stream, which was made the subject of a complaint to this Department. The inspection was made on June 3, 1920, by Mr. A. I. Howd, assistant engineer in this Department, accompanied by Dr. W. H. Sweeting, health officer of the town and village of Savannah; Dr. D. W. Pierce; Mr. V. D. Tallman, president of the village; Mr. T. C. Wethey, village trustee; and Mr. S. E. Wood, town supervisor.

Savannah is an incorporated village having a population of 531 according to the census of 1915, located in the southeastern part of Wayne county. It is on the New York Central railroad, the West Shore railroad, and the Rochester and Syracuse Electric railroad, about 34 miles west of Syracuse. A small stream rises about one mile south of the village, flows through the village, and discharges into Crusoe creek, about two miles distant. The village has no public water supply and no sewerage system.

The cheese factory is located in the northern part of the village near the small stream mentioned above. The factory is owned and operated by the Shefford Cheese Company, Inc., of 419 Fulton street, Syracuse, N. Y., of which Mr. F. W. Chesire is president. Mr. Leon Calandrin is superintendent of the plant at Savannah. The plant was put in operation about 1905, but has been operated by the present firm only for the past four years. The factory is engaged in the manufacture of soft cream cheese, employing from 4 to 6 men. The amount of milk received at the factory varies from 1,500 to 5,000 pounds daily, depending on the season, the maximum amount being received at the time of the inspection. About 1,000 pounds of cheese was being manufactured daily.

The process of manufacture is briefly as follows: The milk is received, weighed, and run into a batch pasteurizer, where it is pasteurized and cooled. "Commercial starter" is added for ripening the milk, which drawn off into 18-quart cans, carried into the "setting room," and allowed to stand for 18 to 24 hours. The contents of the cans run into cheese cloths in the "draining room," the whey running through the cloths on to the floor. The cheese is iced, salted, packed in butter tubs, and shipped.

The water supply of the factory is obtained from a dug well 18 inches in diameter and 25 feet deep, located several feet west of the factory. The water is pumped from the well directly into the mains. A new driven well 6 inches in diameter and 50 feet deep had been constructed near the plant but had not been put into use at the time of the inspection.

In general, there are two classes of wastes to be disposed of from the factory. The first is whey, which amounts to about 3,000 pounds daily. The whey is collected on the floor of the draining room from which it is pumped by an ejector with a 1½-inch suction and 1½-inch discharge into a vat outside the building. The superintendent of the plant stated that all of the whey is taken away by the farmers. The ejector was installed about two weeks previous to the time of the inspection. Prior to the installation of the ejector the whey was discharged through a 6-inch pipe into a cesspool having an overflow into a small stream.

The second class of wastes consists principally of the wash water from floors, cans, and apparatus, and contains slight quantities of milk, whey, curd, and other matter. About 2,000 to 3,000 gallons of water are used daily for washing purposes. The waste water and washings are discharged through a 6-inch floor drain into a concrete cesspool about 8 feet in diameter and 3½ feet deep, constructed in the fall of 1919. The effluent from the cesspool is carried through a 6-inch pipe for about 125 feet to the small stream running in a northerly direction from the village. In the vicinity of the plant the top soil for a depth of about 1 foot is a gravelly loam, which is underlain by about 2 to 3 feet of clay. The ground water elevation is about 4 feet below the surface of the ground.

The discharge of wastes from this factory into the stream is a violation of section 78 and 79 of the Public Health Law, since no permission has been granted and no plans submitted for the treatment and discharge of wastes into the stream. It would seem desirable that they be advised to submit plans to this Department showing the method of disposal of their wastes, and to make application to this Department for permission to discharge their wastes into the stream.

The ditch or stream into which the wastes are discharged has a drainage area of about 0.25 square mile above the point of discharge of the wastes. The volume of flow in the stream at the time of inspection was very small. The stream contained quantities of scum and settled decomposing organic matter. The characteristic odor emanating from this type of matter could be detected a short distance from the stream when in the direct path of the wind. The odor could be detected when near the stream for a distance of probably a half mile below the plant. A mile below the plant there was practically no visible pollution of the stream.

The present objectionable conditions along the stream are probably due largely to the whey which was formerly discharged into the stream. Whey contains such large quantities of decomposable organic matter that it is

practically impossible satisfactorily to dispose of it by discharging it into relatively small streams without creating a nuisance. The practice of having the whey taken away by farmers is an economical and generally satisfactory method of disposal. Care should be taken that all of the whey is taken away daily and none allowed to be discharged into the cesspool or the stream.

The objectionable conditions along the stream may also be due partly to the waste water and washings which are being discharged into it after treatment in the cesspool. In cases where the volume of stream flow is large enough to provide ample dilution, treatment of the waste water and washings in a settling tank or tight cesspool may be sufficient. When the volume of flow in the stream is not sufficient properly to dilute the effluent from the settling tank or cesspool treating the waste water and washings, it is necessary that supplementary works for more complete treatment of these wastes be provided, such as some form of filter, or where soil conditions are favorable, the construction of leaching cesspools to receive and dispose of the effluent from the tanks, or tight cesspools.

The stream should be cleaned of all putrefying organic wastes that have been discharged into it from the point of discharge of the wastes as far as objectionable conditions are created. The owners of the factory should then be given an opportunity to operate the cesspool properly, excluding all whey and other refuse containing considerable amounts of organic matter. If it be found after a reasonable time that the volume of flow in the stream is not sufficient properly to dilute the effluent from the cesspool, it will be necessary to provide supplementary works for more complet treatment of the wastes, plans for which should be submitted to this Department for approval.

It was alleged at the time of the inspection that sewage from residences in the village is discharged into the stream above the factory. Since the stream was covered for some distance through the village it could not be definitely determined at the time whether or not there were any house connections to the stream. The local board of health of the village should make a careful survey of the parts of the village involved with a view of improving the sanitary condition of the stream in the village.

As a result of this inspection, I conclude that the objectionable conditions complained of are caused by the conditions mentioned above, and I therefore recommend:

1. That the owners of the factory continue to have all the whey taken away by farmers, and allow none to enter the cesspool or the small stream west of the factory.
2. That the cesspool be used to treat the wash water only, and that the matter of additional treatment be held in abeyance until it is determined whether or not conditions of nuisance are caused when the cesspool is operated properly.
3. That the stream be cleaned of all putrefying organic wastes that have been discharged into it from the point of discharge of the wastes as far as objectionable conditions are created.
4. That the owners of the factory submit to this Department for approval plans showing the present works for the treatment and disposal of the wastes, and that they make application to this Department for permission to discharge the waste water and washings from the factory into the stream.

I further recommend that copies of this report be sent to the local boards of health of the village and town of Savannah, to the sanitary supervisor of the district, to the complainant, and to the Shefford Cheese Company, Inc., at Syracuse, N. Y.

Respectfully submitted

THEODORE HORTON

Chief Engineer

ALBANY, N. Y., *June* 30, 1920

Copies of this report were sent on July 1, 1920, to the Shefford Cheese Company, Inc., to the local boards of health of the Town and Village of Savannah, to the sanitary supervisor, and to the complainant. On September 8, 1920, application was received for permission to discharge wastes from the factory. A permit was issued on September 17, 1920, for permission to discharge effluent from the settling tank to treat waste water and washings into a tributary of Crusoe creek.

In addition to the foregoing, inspections were made and reports transmitted to the local authorities or advice was given by correspondence in the matter of abatement of nuisances at the following places: Akron, Amsterdam, Chemung, Cornwall (town), Darien Center, Dundee, East Greenbush, East Moriches, Elmira, Geneseo (town), Harrison, Hempstead, Hudson, Kensico Manor, Kingston, Lancaster, Madrid Mannville (town of Colonie), Maplewood (town of Colonie), Marlborough (town), Mount Pleasant (town), Newark, Pittsford, Plattsburg, Port Chester, Purchase, Rotterdam (town), Schenectady, Skaneateles, Spring Lake (town of Conquest), Stephentown, Syracuse, and Van Hornesville.

SPECIAL INVESTIGATIONS

INVESTIGATION OF SANITARY CONDITION OF STATE INSTITUTIONS

Under the provisions of section 14 of the Public Health Law, the State Commissioner of Health is required to make from time to time, and at least once in each year, an examination and inspection of the sanitary conditions of all State institutions, and to transmit copies of his report and recommendations thereon to the president of the board of managers or trustees or other authority in charge of such institution, and to the Fiscal Supervisor of State Charities in case of institutions reporting to that official.

During 1920 the scope of investigation was confined to matters of water supply, milk supply, sewage and sewage disposal and refuse disposal. The sanitary conditions of some twenty-nine institutions were investigated during the year and reported upon, and as required by law the reports transmitted to the institution authorities.

Below will be found abstracts of the reports on the institutions investigated.

ALBION (Western House of Refuge for Women)

An investigation of the sanitary condition of the Western House of Refuge for Women at Albion, Orleans county, was made by Mr. C. A. Howland, assistant engineer in this Department, on January 14, 1920. Previous investigations of the institution were made by this Department in 1911 (see page 940 of the 32d Annual Report); in 1914 (see page 837, Vol. II, of the 36th Annual Report), and in 1917 (see page 631, Vol. II, of the 38th Annual Report). Special investigations of the sewage disposal plant of the institution were made in 1907 (see page 721, Vol. II, of the 28th Annual Report) and in 1908 (see page 199, Vol. II, of the 29th Annual Report). Plans for sewage disposal were approved by this Department on October 13, 1898. and on May 8, 1912.

Location: Village of Albion, Orleans county.

Site of institution: The institution is located near the western boundary of the village of Albion. The station of the New York Central railroad in the village is about one mile from the institution, and a station of the Buffalo, Lockport and Rochester Electric Railway is located practically at the gate of the institution. The Erie canal passes just to the north and the New York Central railroad just to the south. A small creek runs through the institution grounds. In the vicinity of the buildings the ground slopes are such that the drainage is good, but the engineer was informed that some portions of the farm lands are rather low and because of the improper arrangement of the drain tile are not well drained.

Area of grounds: 92.5 acres.

Number of occupied buildings: 13 (and one in course of construction).

Capacity: 215 women, 57 employees, total 272.

Present population: 174 women, 15 infants, 52 employees, total 241.

Class of inmates: The institution receives upon commitment females between the ages of 16 and 30 years, convicted by any court or magistrate of petit larceny, vagrancy, habitual drunkenness, of being a common prostitute, of frequenting disorderly houses or houses of prostitution, or of a misdemeanor, and who are not insane or mentally or physically incapable of substantially benefiting by the discipline of such institution.

Water supply: The principal water supply of the institution is obtained from the public water supply of the village of Albion. It is derived from an impounding reservoir on Otter creek, about two miles west of the village, and from wells located just outside of the village and north of the Erie Canal. The water is pumped, is filtered through gravity mechanical filters, and is treated with hypochlorite of lime. An auxiliary supply is obtained from a drilled well about 30 feet deep and extending into rock, which is located near the farmer's cottage. Water is drawn from it by means of a hand pump. At the time of the investigation it was found that a number of possible sources of contamination existed near the well, including a privy without vault, a cesspool, and an area of ground upon which sink drainage is discharged. A third grossly contaminated supply, which was obtained from a well near the power house, has been abandoned in accordance with the recommendations of this Department.

Milk supply: About 80 quarts of milk is obtained from the institution herd of 13 head, and 70 quarts by purchase from a milk dealer who obtains milk from local farmers. As no milk-house is provided near the barn, the milk from the institution herd is strained in the barn and taken directly to the industrial building, where it is again strained and delivered to the cottages where it is placed in refrigerators. It is used without pasteurization. Milk is purchased under a yearly contract which includes specifications as to butter fat and solid content of the milk and conditions under which the milk is to be produced, but none as to the grade of milk or pasteurization.

Sewerage and sewage disposal: The sanitary sewage of the institution is collected by a system of sewers and discharged through an 8-inch sewer into the sewerage system of the village of Albion. The sewage is therefore passed through the village sewage disposal plant consisting of a grit chamber, settling tanks, and contact beds before it is discharged into Sandy creek. The sewage from the flush closet and other plumbing fixtures, except the kitchen sink, at the farmer's cottage is discharged into a cesspool located in the garden about 60 feet north of the cottage. Sewage seeps out of the ground at the cesspool during the summer months, and it would therefore appear that the cesspool is no longer capable of satisfactorily disposing of the sewage from the farmer's cottage.

Refuse disposal: The garbage is stored in galvanized iron cans at each cottage. It is collected three times a week and taken to the piggery where it is fed to the institution herd of 24 swine. Combustible rubbish is burned in the kitchens of the several cottages, or is taken to the boiler house where it is burned. Noncombustible refuse is used for filling at a considerable distance from the buildings of the institution.

Recommendations

1. That in view of the potentially dangerous character of the water obtained from the well at the farmer's cottage, this well be abandoned.
2. That proper toilet facilities be provided at the barn, and that the privy near the barn be discontinued.
3. That the receptacle for the storage of the garbage at the piggery be provided with a cover and be kept covered.
4. That the construction of a properly designed and constructed system of sewage disposal for all of the sewage of the farmer's cottage be undertaken as soon as possible.
5. That arrangements be made by the institution authorities to use only pasteurized milk at the institution, either by pasteurizing all milk at the institution, or by pasteurizing the milk produced at the institution and purchasing only pasteurized milk; and that a properly designed and constructed milk-house be provided.

BATAVIA (State School for the Blind)

An investigation of the sanitary condition of the State School for the Blind at Batavia, Genesee county, was made by Mr. C. A. Howland, assistant engineer in this Department, on January 13, 1920. Previous investigations of the institution were made by this Department in 1911 (see page 948 of the 32d Annual Report); in 1914 (see page 476, Vol. II, of the 35th Annual Report) and in 1917 (see page 632, Vol. II, of the 38th Annual Report). A special investigation of the sewage disposal plant was made in 1907 (see page 726, Vol. II, of the 28th Annual Report).

Location: City of Batavia, Genesee county.

Site of institution: The institution is situated in the southern part of the city of Batavia, on property which is higher than the surrounding land.

Area of ground: 60.7 acres.

Number of occupied buildings: 11.

Capacity: 180 pupils consisting of 104 boys and 76 girls; 68 employees, total 248.

Present population: 86 boys, 63 girls, 68 employees, total 217.

Class of inmates: Blind persons between the ages of 5 and 21 years who are not incapacitated for useful instruction by mental, physical, or moral infirmity.

Water supply: The principal water supply for the school is obtained from the public water supply of the city of Batavia. This supply is derived from Tonawanda creek which is seriously contaminated. Before delivery to the city mains, however, the water is treated by coagulation, filtration through gravity mechanical filters, and chlorination with liquid chlorine. At the institution there are two systems of piping, one for drinking water and the other for general utility purposes. The latter, in addition to city water, at times receive rain water pumped from a cistern. Pumps have been installed to increase the pressure for fire purposes and to raise the service pressure in the mains when it becomes low. A small pump also raises water from the cistern to 2 or 3 tanks located in the attic of the main building. A float valve controls the entrance of water from the city water supply into the cistern from which the fire pump draws water. A second cistern supplies water to a hand pump located in a lavatory on the second floor of the main building. The utility supply is filtered at the main building and at the kindergarten. At the former a Continental-Jewell pressure mechanical filter is used, and at the latter a Paddock water filter unit.

Milk supply: The entire milk supply is purchased from the Fargo Dairy Company under verbal contract. Grade A pasteurized milk is used.

Sewerage and sewage disposal: A system of combined sewers ranging in size from 5 to 8 inches collects the sewage and as much of the storm water as is not used in the utility water supply. They are discharged into the city sewage disposal plant which consists of settling tanks, a dosing tank, and sprinkling filters. The cisterns of the institution overflow into the sanitary sewers, and the discharge of storm water in this manner into the sanitary sewerage system of Batavia may overload the city sewage disposal plant.

Refuse disposal: Garbage is stored in galvanized iron cans in the kitchens. It is collected daily by a farmer. Combustible rubbish is burned. Noncombustible rubbish is placed on a dump near a marshy area and at a considerable distance from the buildings.

Recommendations

1. That the pumping of storm water from the cisterns into the mains of the institution, and the use of this water for any purpose whereby it would be accessible to the persons at the institution for drinking purposes be discontinued.

2. That the filters at present used to filter the general utility supply at the institution be discontinued.

3. That all connections for the discharge of storm water or rain water into the sanitary sewers be disconnected, and such water be discharged into the storm sewers.

4. That only pasteurized milk be accepted and used at the institution.

BATH (State Soldiers' and Sailors' Home)

An investigation of the sanitary condition of the New York State Soldiers' and Sailors' Home at Bath, Steuben county, was made by Mr. W. C. Emigh, assistant engineer in this Department, on July 1 and 2, 1920. Previous investigations of the institution were made by this Department in 1911 (see page 957 of the 32d Annual Report), in 1914 (see page 476, Vol. II, of the 36th Annual Report), and in 1918 (see page 518, Vol. II, of the 39th Annual Report). A special investigation of the sewage disposal plant was made in 1907 (see page 728, Vol. I, of the 28th Annual Report). Plans for sewerage and sewage disposal were approved on August 27, 1909.

Location: Bath, Steuben county, N. Y.

Site of institution: The New York Soldiers' and Sailors' Home is situated on the south bank of the Cohocton river, about 2 miles northwest of the village of Bath. The grounds of the institution rise from an elevation of about 1,225 feet above mean sea level at the river to an elevation of 1,500 feet about three-quarters of a mile south of the river. The main buildings are located on a strip of low level land about one-quarter of a mile wide immediately adjacent to the river.

Area of grounds: 375.5 acres.

Number of occupied buildings: About 40.

Capacity: 1,600 men, 179 employees, total 1,779.

Present population: 600 men, 174 employees, total 774.

Class of inmates: Honorably discharged soldiers and sailors who served in the army or navy of the United States during the late rebellion, who enlisted from the State of New York, or who shall have been residents of the State for one year preceding their application for admission.

Water supply: The institution water supply is derived from two separate sources: A battery of three wells located under the power house, and three springs on the institution farm. Water is pumped from the wells directly into the distribution mains by pumps located in the basement of the power house. The surplus water from the mains flows into a reservoir located on a hill in the rear of the institution buildings. The springs are all located within a short distance of the institution farm house. The area above the springs is unpopulated and no permanent sources of pollution were found thereon. Water collected from the three springs is piped to the reservoir previously mentioned. The water mains in the institution are cross-connected to the municipal water supply of the village of Bath.

Milk supply: The milk supply of the institution is obtained from the institution herd and from a local dairy. The former furnishes about 400 quarts daily, and the latter about 100 quarts. Subsequent to the inspection of 1918, the cow barn and stable have been rebuilt. The milk house is a separate building but in convenient proximity to the stable. Neither the milk produced at the institution nor that purchased from the local dairy is pasteurized.

Sewerage and sewage disposal: The sanitary sewage and storm water of the institution are collected in separate system of sewers. The sanitary sewers lead to a disposal plant which consists of two primary settling tanks and two secondary settling tanks. The filter plant was designed and constructed to be operated as a chemical precipitation tank. The quantity of chemicals used has been decreased from year to year until at the present time only a negligible quantity is used, and the plant is operated as a plain sedimentation tank. The effluent of the plant is discharged into the Cohocton river. Sewage from the superintendent's residence, the farm house, and the

cottages south of the main gate is disposed of by three separate tanks or cesspools.

Refuse disposal: A garbage house is provided near each of the two main kitchens at the institution. Garbage is removed from these houses twice daily to the piggery where it is fed to swine. Bones and some of the fats are rendered. Combustible rubbish is salvaged or burned. Noncombustible rubbish is disposed of on a dump on the bank of the river.

Recommendations

1. In regard to the water supply I recommend:

   a That suitable fences be constructed around the area in the immediate vicinity of the springs to prevent inmates, employees, or trespassers from passing over any ground located less than 100 feet above or on either side of any spring or less than 50 feet below any spring.

   b That ditches and embankments be constructed and maintained in condition effectively to prevent surface water from reaching the spring.

   c That analyses of the water supply be made at frequent intervals to detect the presence of pollution.

2. In regard to the milk supply I recommend:

   a That the dairy from which milk is purchased be regularly and frequently inspected.

   b That the entire milk supply be pasteurized at the institution by approved methods.

3. In regard to sewers and sewage disposal I recommend:

   a That the sewers be flushed at regular and frequent intervals.

   b That a new sludge bed of suitable size be constructed at some point remote from the institution buildings and that the present sludge bed be abandoned.

   c That the present sewer outfall be extended under the bed of the river to a point which will provide a submerged outfall at all times in the main channel.

   d That the institution authorities consider the question of replacing the present sewage disposal plant by one of modern design, and that plans for such a plant be prepared and submitted to this Department for approval.

4. In regard to the disposal of refuse I recommend:

   a That covers be provided for all barrels used in the collection of garbage and that these barrels be kept covered at all times.

BEACON (Matteawan State Hospital)

An investigation of the sanitary condition of the Matteawan State Hospital at Beacon, Dutchess county, was made by Mr. C. A. Howland, assistant engineer in this Department, on February 24 and 25, 1920. Previous investigations of the sanitary condition of the institution were made by this Department in 1915 (see page 995, Vol. II, of the 36th Annual Report) and in 1917 (see page 651, Vol. II, of the 38th Annual Report).

Location: City of Beacon, Dutchess county, N. Y.

Site of institution: The main buildings of the institution are situated on a hill about 1 mile north of the built-up sections of Beacon, and 1¾ miles east of the eastern bank of the Hudson river. The elevation of the ground at the main buildings is about 320 feet above the river, and the land slopes away from the buildings in all directions, affording adequate drainage. The soil is a sandy clay.

Area of grounds: 482.22 acres, of which about 396 are under cultivation.

Number of occupied buildings: 7.

Capacity: 549 men, 108 women. 220 officers and employees, total 877.

Present population: 782 men, 122 women, 185 officers and employees, total 1,089.

Class of inmates: Insane, committed by order of courts of criminal jurisdiction and convicted of petty crimes, not felons; persons becoming insane while undergoing sentence; also patients from other state hospitals who still exhibit criminal tendencies.

Water supply: The water supply of the institution is derived from 5 drilled wells located east and north of the main building and at a considerably lower elevation than the buildings. An 8-inch main also connects the institution water system with the public water supply system of the city of Beacon. The water from the city of Beacon is used principally in case of a breakdown in the institution supply. Each well is 8 inches in diameter and about 300 feet deep. The water is forced by air lift into a covered suction well from which it is pumped into two covered cisterns near the power house. From the cisterns water is pumped into the institution mains, the excess over consumption passing into a standpipe. The hardness of the water has been the source of trouble at the institution, particularly because of the scale which has formed extensively in the pipes of the hot and cold water systems.

Milk supply: The milk for the institution is obtained from the institution herd of 71 cows. The herd was tuberculin tested in March, 1919. Inmates are employed in milking. No provision is made for pasteurization of the milk.

Sewerage and sewage disposal: The sanitary sewage and storm water of the institution are collected in a system of combined sewers and discharged into the Hudson river without treatment. The sewers are flushed by means of flush tanks. The domestic sewage flows into a flush tank from which it is discharged by means of a siphon of the type having a movable reservoir trap hung on trunions, into the Hudson river at a point about 2½ miles above the Beacon station of the New York Central railroad.

Refuse disposal: Garbage is stored at the kitchens in barrels without covers. It is taken daily to the piggery and is fed to swine. Dust bins are provided on each ward, and the rubbish is collected daily and taken to a dump where the combustible rubbish is burned. Rags and papers are baled and sold.

Recommendations

1. That in view of the unsatisfactory conditions which exist in regard to the water supply of the institution, the authorities in charge of the institution consider as soon as practicable the matter of abandoning the present water supply and obtaining a supply sufficiently soft for the needs of the institution and of safe sanitary quality and adequate quantity.
2. That the institution authorities obtain an appropriation for and request the State Architect to prepare plans for the disposal of wash water and sewage from the milk house, such plans to be submitted to this Department for approval, as required by the Public Health Law.
3. That in view of the conditions surrounding the production of milk for the institution, the potentially infective character of milk, and the necessity of preventing the spread of infection from this source, arrangements be made effectively to pasteurize all the milk of the institution.
4. That the outfall sewer from the institution to the Hudson river be extended to such a point that unobstructed discharge of sewage into the river shall be obtained at all times.
5. That the storm water and sanitary sewage be separated, and that the sanitary sewage be given preliminary treatment before being discharged into the Hudson river.
6. That an additional pump of adequate capacity be installed in a separate, fire-proof building, and be directly connected to the water supply system for use in case of fire.

BEDFORD HILLS (State Reformatory for Women)

An investigation of the sanitary condition of the New York State Reformatory for Women at Bedford Hills, Westchester county, was made by Mr. C. A. Howland, assistant engineer in this Department, on February 26, 1920.

Previous investigations of the sanitary condition of the institution were made by this Department in 1911 (see page 964 of the 32nd Annual Report), in 1915 (see page 843, Vol. II, of the 36th Annual Report), and in 1917 (see page 632, Vol. II, of the 38th Annual Report). A special investigation of the water supply was made in 1919 (see page 122, Vol. II, of the 40th Annual Report), and special investigations of the sewage disposal plant were made in 1911 (see page 622 of the 32nd Annual Report), in 1916 (see page 776, Vol. II, of the 37th Annual Report), in 1917 (see page 658, Vol. II, of the 38th Annual Report), and in 1919 (see page 437, Vol. II, of the 40th Annual Report). Plans for water supply were approved on November 24, 1914; September 11, 1919; and September 17, 1920; and plans for sewerage and sewage disposal were approved on July 16, 1909; May 18, 1914; December 17, 1914; July 7, 1915; March 14, 1917; April 7, 1920; April 19, 1920; and July 9, 1920.

Location: About 1 mile northeast of Bedford Hills station, town of Bedford, Westchester county.

Site of institution: The buildings are all located on elevated ground bordering Broad brook which is a tributary of the Stone Hill river, and Croton lake of the New York city water supply.

Area of ground: 195.5 acres.

Number of occupied buildings: 31.

Capacity: 400 women, 123 officers and employees, total 523.

Present population: 289 women, 23 infants, 99 officers and employees, total 411

Class of inmates: The institution receives, upon commitment, delinquent females between the ages of 16 and 30 years who are not insane, or mentally or physically incapable of being substantially benefited by the discipline of such an institution.

Water supply: The original source of water supply for the institution was a brick well 20 feet in diameter and about 20 feet deep, located near the power house and about 30 feet west of Broad brook. A circular well 30 feet in diameter and 30 feet deep, located about 10 feet west of the first well and 60 feet from the brook, is also in use. An apparatus of the Wallace & Tiernan bubbling solution feed type for chlorination with liquid chlorine is used for the disinfection of the water. Plans were approved on September 11, 1919, for 3 wells, 2 inches in diameter, to be located on the side of the brook opposite the old wells, about 60 feet from it. At the time of the investigation the water supply was being pumped from the newer of the two original wells as much as possible, but when this well is drawn down so that water cannot be obtained from it, water is pumped from the old well. The water is pumped into an 80,000 gallon standpipe. An elevated tank is available but not used owing to the inadequacy of the present pumping equipment.

Milk supply: The milk supply is obtained partly by purchase and partly from the institution herd of 35 cows. The herd was tested for tuberculosis in February, 1920, and tubercular cows were disposed of. At the time of the inspection the cow barn was found to be carefully maintained, but because of the type of construction it cannot be considered satisfactory. The inmates do a large part of the milking. Although a bulk pasteurizer of about 50 gallons capacity has been installed, the milk is not pasteurized. In addition to about 250 quarts produced at the institution, 120 quarts per day of grade B raw milk from local dairies is purchased under a yearly contract.

Sewerage and sewage disposal: The sewage of the institution is collected in a system of sanitary sewers and conveyed to a sewage disposal plant consisting of a screen chamber, Imhoff tanks, dosing chambers, sand filters, sand catcher, chlorinating apparatus, and mixing chamber. An 8-inch main trunk sewer passes under Broad brook through two 8-inch castiron inverted siphons. Screenings from the screen chamber are placed on the sludge bed. During the summer only 2 of the 3 circular Imhoff tanks are used, but at the time of the inspection all were being operated in series. Four Miller siphons in each of 2 dosing tanks discharge the sewage in rotation onto either of 2 sand filters consisting of 4 beds each. After passing through the sand

catcher the sewage is disinfected in the chlorinating building, in which are located 2 Wallace & Tiernan chlorinators of the manometer feed type.

Refuse disposal: Garbage is stored in covered galvanized iron cans. It is collected semiweekly and fed to swine. Combustible rubbish is burned in an incinerator, and noncombustible rubbish is placed on a dump.

Recommendations

1. That a water supply for the institution of adequate quantity and of safe sanitary quality be developed as soon as possible according to the plans approved by this Department, or approved amendments thereof.
2. That the surroundings of the present and the new wells be maintained in a sanitary condition, and that the chlorination of the water at a rate not less than 0.3 of a part by weight of chlorine per million parts of water treated be maintained at present and continued when the new wells are placed in service.
3. That scales be provided on which to rest the chlorine cylinders of the chlorinators at the power house, that the rate of application of the chlorine to the water be frequently checked by the scales, and that the rate of application of chlorine to the water be included in the reports made each month by the institution authorities to this Department.
4. That adequate pumping equipment be provided for the water supply of the institution.
5. That a properly designed and constructed cow barn be provided as soon as practicable.
6. That the drainage of the milk house be placed in sanitary operating condition, that the interior walls be painted, that screens be provided for the milk house, that the pails and cans be sterilized by a steam jet and placed to dry on a rack in an inverted position in the open air at a place where dust and dirt will not reach them, and that a proper cooler for the milk be provided.
7. That in view of the conditions surrounding the production of milk for the institution, the potentially infective character of milk, and the necessity of preventing the spread of infection from this source, arrangements be made to use only pasteurized milk at the institution, either by pasteurizing the milk produced at the institution and purchasing only pasteurized milk, or by pasteurizing both the institution milk and the purchased milk at the institution.
8. That permanent, level seats for the siphons of the dosing chamber of sewage filter beds 3, 4, 5, and 6 at the sewage disposal plant be provided, that the distributing troughs be repaired where necessary, and that the manometer of the chlorinator in use at the time of the inspection be repaired.

BINGHAMTON (State Hospital)

An investigation of the sanitary condition of the Binghamton State Hospital at Binghamton, Broome county, N. Y., was made by Mr. C. A. Howland, assistant engineer in this Department, on March 10 and 11, 1920. Previous investigations of the sanitary condition of the institution were made by this Department in 1915 (see page 896, Vol. II, of the 36th Annual Report) and in 1918 (see page 519, Vol. II, of the 39th Annual Report). A special investigation of the water supply was made in 1909 (see page 225, Vol. II, of the 30th Annual Report), and a special investigation of the sewerage system was made in 1915 (see page 226, Vol. II, of the 36th Annual Report). Plans for water supply were approved by this Department on August 25, 1911, and January 25, 1919; and plans for sewage disposal were approved on March 13, 1918.

Location: Binghamton, Broome county, N. Y.

Site of institution: The main buildings of the institution are located in the northeastern part of the city of Binghamton, on a hill about 200 feet

ove the Susquehanna river and 1,050 feet above mean sea level. Three rms owned by the State and operated in connection with the institution e situated on the northern bank of the Susquehanna river east of the incipal buildings. The ground slopes are apparently sufficient to provide lequate drainage at the main group of buildings and the drainage of cerin low areas at the farm is in progress.

Area of grounds: 1,363 acres.

Number of occupied buildings: About 30.

Capacity: 1,355 men, 1,045 women, 555 officers and employees, total 2,955.

Present population: 1,477 men, 1,226 women, 515 employees, total 3,218.

Class of inmates: All classes of insane expect the criminal insane.

Water supply: The principal water supply of the institution is derived rom the Susquehanna river and wells. The intake from the river discharges nto a subterranean infiltration gallery of masonry construction in the botom of which are 9 flowing wells each about 6 inches in diameter and 12 eet deep. In addition to the wells in the infiltration gallery, there are 5-inch driven wells from which the water is pumped into the infiltration gallery. The water is filtered by gravity mechanical filters after coagulation with alum. After filtration the water is pumped into the mains of the nstitution, the excess of water pumped over water used going to a reservoir on the hill north of the institution buildings.

Milk supply: The milk supply for the institution is obtained partly by purchase and partly from the two institution herds. One herd consists of 96 cows which have not been tuberculin tested. The second herd consists of 46 cows which have been tuberculin tested and found to be healthy. In addition to about 2,300 quarts per day obtained from this herd, 300 quarts of grade B raw milk were being purchased from local milk dealers. The milk is pasteurized in a batch pasteurizer.

Sewerage and sewage disposal: The sewage of the main institution is collected by a system of combined sewers and is discharged into the Binghamton city sewerage system. Some stoppages have occurred from rags and other material put into the sewers by the patients. At a number of farm colonies and at the power house privies and cesspools are in use.

Refuse disposal: The garbage of the institution is stored in galvanized-iron cans at the several kitchens, from which it is collected daily and transported to a piggery where it is fed to swine. Rubbish is stored in open barrels, cans, or bins. Rags and papers are salvaged.

Recommendations

1. That the institution authorities consider the installation of a more adequate and suitable chlorinating apparatus to sterilize the effluent of the water filtration plant at all times.

2. That the matter of lining the reservoir at the main institution with a suitable water-tight material which may be more easily cleaned be considered by the institution authorities.

3. That a supply of water of safe sanitary quality be provided for Pine Camp, either by the purification of the river water or by obtaining water from some other source, and that this supply be connected to all fixtures of the camp from which it is possible to obtain water for drinking or culinary purposes.

4. That the pasteurizer be sterilized with steam before as well as after using.

5. That as previously recommended in our report of March 13, 1918, from an examination of the plans for a sewage pumping station at the power plant, the 5 wells outside the power house be abandoned and the lines from the wells to the pump be disconnected and capped before the sewage pumping plant is put in operation.

6. That inside toilet fixtures be installed at all the farm houses, and that satisfactory plans for suitable sewerage systems and sewage disposal plants for the farm houses and camp be prepared and submitted to this Department for approval.

7. That a sufficient number of receptacles fitted with suitable covers be provided for the storage of garbage and rubbish, that these receptacles be kept covered, and that the receptacles and their surroundings be maintained in a sanitary condition.

BUFFALO (State Institute for the Study of Malignant Diseases)

An investigation of the sanitary condition of the State Institute for the Study of Malignant Diseases at Buffalo, and the farm conducted in conjunction therewith at Springville, Erie county, was made by Mr. W. C. Emigh, assistant engineer in this Department, on June 29, 1920. Previous investigations of the sanitary condition of the institution were made by this Department in 1915 (see page 1027, Vol. II, of the 36th Annual Report) and in 1918 (see page 522, Vol. II, of the 39th Annual Report).

Location: The main buildings of the institution are located on High street, in the city of Buffalo. A farm comprising about 35 acres, maintained for use in connection with the institution and on which are kept such animals as are used in experimental pathology and research, is located about one mile east of the village of Springville, Erie county, N. Y.

Site of institution: The cottage and farm buildings are situated on elevated ground overlooking the road. The slope of the ground away from these buildings is steep and the terrain is in general of a rolling nature.

Area of farm grounds: 35 acres.

Number of occupied buildings at farm: 5, including barn and garage.

Water supply: The water supply of the main buildings of the institution located in the city of Buffalo is obtained from the mains of the public water supply of Buffalo. The water is filtered in apparatus installed by the Loomis-Manning Filter Distributing Company for the purpose of removing sediment and effecting a reduction in the turbidity of the water used at the main buildings. At the farm, the water supply is derived from a spring. Water flows from the spring to a hydraulic ram by which it is pumped into a pressure tank against compressed air.

Milk supply: The milk supply for the bacteriologist and his family, who are the only residents of the farm, is obtained from one cow and several goats.

Sewerage and sewage disposal: Sewage from the two houses at the farm is conducted to two sewage disposal plants, each consisting of a settling tank and a subsurface irrigation system.

Recommendations

1. That the institution authorities exercise such supervision as may be necessary to insure the maintenance at all times of proper sanitary conditions at and about the bungalow located near the spring.
2. That frequent analyses be made of the water from the spring, and should these analyses at any time indicate active contamination, a new supply of satisfactory quality be found and developed.
3. That plans be prepared and submitted to this Department showing details of construction of the two sewage disposal plants now in operation on the farm.

CENTRAL ISLIP (State Hospital)

An investigation of the Central Islip State Hospital at Central Islip, Suffolk county, was made by Mr. C. A. Howland, assistant engineer in this Department, on April 5 and 6, 1920. Previous examinations of the sanitary condition of the institution were made by this Department in 1914 (see page 915, Vol. II, of the 36th Annual Report), in 1916 (see page 643,

Vol. II, of the 38th Annual Report), and in 1918 (see page 523, Vol. II, of the 39th Annual Report). Special investigations of the sewage disposal plant were made in 1907 (See page 744, Vol. II of the 28th Annual Report), and in 1910 (see page 490 of the 31st Annual Report). Plans for water supply were approved by this Department on July 17, 1916; August 11, 1919; November 6, 1919; and plans for sewerage were approved on August 12, 1918.

Location: Central Islip, Suffolk county, N. Y.

Site of institution: The hospital is situated in the central part of the town of Islip, about one mile south of the unincorporated village of Central Islip. The land in the vicinity is almost level. Its elevation above sea level averages about 60 feet. The top soil in the vicinity is of loam, mixed with sand and gravel overlying sand.

Area of grounds: 994 acres.

Number of occupied buildings: 129, 64 of which are used for housing patients.

Capacity: 2,369 men, 1,731 women, 875 employees, total 4,975.

Present population: 3,014 men, 2,520 women, 675 employees, total 6,209.

Class of inmates: All classes of insane except the criminal insane.

Water supply: The buildings of the institution are arranged in two separate groups known as the North and South colonies. Each of these groups has its own water system, and with the exception of a 4-inch line connecting the two which is used only in case of emergency, the systems are entirely separate. The water supply of the North colony is derived from 16 shallow and 2 deep wells located near the power house. The water supply of the South colony is derived from 22 shallow and 3 deep wells located similarly to those at the North colony. In view of the unsatisfactory location of the shallow wells, it was recommended in previous reports that a water supply from deep wells be developed as rapidly as possible and the shallow wells abandoned. As a result of these recommendations the 5 deep wells mentioned have been driven, and at the time of the inspection a third deep well was being driven at the North colony. A soft, rust-colored scale forms in the mains, especially at the refrigerating plant, and it is necessary to replace and clean the pipes at this place each year.

Milk supply: The milk used at the institution is obtained partially by purchase and partially from the institution herd of 29 cows. An average of 520 quarts of condensed milk and 560 quarts of fluid milk are purchased daily under a contract which specifies grade B raw milk. This milk is pasteurized after delivery at the institution. An average of 130 quarts of milk is produced by the institution herd. This milk is not pasteurized.

Sewerage and sewage disposal: The domestic sewage from the various buildings is collected by two separate sewerage systems, one serving the North colony and the other the South colony. The sewage of the two colonies is conveyed to sewage disposal plants consisting of screens, settling tanks, pumping plants, and broad irrigation fields. Almost the entire area of the field is covered with brush and small trees. It has been recommended by this Department in 1910, 1915, and 1917, that the entire sewage disposal plant of the institution be remodelled and arranged so that the sewage could be treated by sedimentation and intermittent sand filtration.

Refuse disposal: At the South colony garbage is placed directly in two metal-bodied cars mounted on railroad trucks in which it is taken to the piggery. At the North colony garbage is stored in cans and is collected and taken in wagons to the piggery where it is fed to swine. The rubbish is collected daily and burned in metal braziers erected at convenient points for this purpose, or is taken to a point near the reduction plant where it is buried in trenches. The meat bones were being dumped near a concrete block building in which had formerly been operated a reduction plant. The waste paper and rags from the institution are baled and sold. The scrap metal is also sold.

Recommendations

1. In view of the fact that the shallow wells at both colonies are so located as to be subject to pollution which may at any time become active, I would recommend:

(a) That the deep well supply be developed as rapidly as possible.

(b) That the deep wells be so located that it will be unnecessary for patients or others to pass over the ground near them.

(c) That trespassing be prohibited on the ground near the wells.

2. In regard to the disposal of the sewage of the hospital I would recommend:

(a) That a careful study be made of the problem of disposing of the sewage from the hospital, and satisfactory plans for a suitable sewage disposal plant be prepared by the State Architect either along the lines suggested in our report of 1910 or along other lines which as a result of a careful study of the situation may seem desirable.

(b) That such plans for satisfactory methods of sewage disposal when prepared be submitted to this Department for approval as required by the Public Health Law: and as soon as the plans are approved by this Department and financial and labor conditions warrant it, the construction of the sewage disposal plant be undertaken.

(c) That until such construction work can be carried out the present broad irrigation field, together with such extensions as may be made, be properly maintained and operated.

In order to accomplish this I would recommend:

(a) That the underbrush and weeds be removed from the area to which the sewage is applied, which area should be at least 50 acres in extent, and the ground be prepared by properly raking to receive the sewage.

(b) That suitable rest periods be allowed for each section of the area during which the surface should be scraped and raked.

3. In regard to the milk supply of the institution I would recommend:

(a) That the entire fluid milk supply of the institution, whether purchased or obtained from the institution herds, be effectively pasteurized.

(b) That the pasteurizer be sterilized with steam both before and after use.

(c) That means be provided effectively to sterilize the milk cans and utensils with steam.

4. In regard to refuse disposal I would recommend:

(a) That in view of the insanitary condition created by the present methods of disposing of the bones, a suitable platform or bin, properly screened, be provided for storing them until they are finally disposed of, that they be disposed of as rapidly as possible, and that the place of storage be maintained in a sanitary condition at all times.

(b) That an adequate number of receptacles for the storage of garbage and refuse be provided, that these receptacles be kept covered at all times, and that the receptacles and other surroundings be maintained in a sanitary condition.

COLLINS (Gowanda State Homeopathic Hospital)

An investigation of the sanitary condition of the Gowanda State Homeopathic Hospital, at Collins, Erie county, was made by Mr. Henry Ryon, assistant engineer in this Department, on January 19, 1920. Previous investigations of the sanitary condition of the institution were made by this Department in 1915 (see page 923, Vol. II, of the 36th Annual Report) and in 1917 (see page 644, Vol. II, of the 38th Annual Report).

Special investigations of the water supply were made in 1919 (see page 155, Vol. II, of the 40th Annual Report). Plans for water supply for the institution were approved by this Department on August 30, 1916.

Location: Town of Collins, Erie county, N. Y.

Site of institution: The institution is located on the Buffalo and Jamestown branch of the Erie railroad 13 miles south of Buffalo. The main buildings of the institution are on high ground lying between Clear creek and Cattaraugus creek. The former stream flows through the northeast part of the institution property, and the latter is about a mile and a quarter west of the main buildings.

Area of grounds: 700 acres.

Number of occupied buildings: 18, not including barns, stables, sheds, etc.

Certified capacity: Men 520, women 430, total 950.

Present population: Inmates, men 737, women 585, total 1,322; employees 200; total population, 1,522.

Class of inmates: Insane, except criminal insane, from the counties of Cattaraugus, Chautauqua, Erie, Wyoming, and those from other parts of the State for whom homeopathic treatment is desired.

Water supply: The water supply is obtained from two groups of springs located on opposite sides of the institution. The water from the group known as the Collins springs is collected in a concrete reservoir sunk in the ground just below them, and is raised from the basin to the main reservoir by an electrically driven centrifugal pump. The supply from the other group of springs, which is located on the Cattaraugus Indian reservation, is supplemented by the flow from a drilled well used as a down take for one of the air lifts which raise water from the springs to the main storage reservoir. The main reservoir into which the water from all the springs is discharged is an open rectangular basin having a capacity of approximately 1,000,000 gallons. It is apparent that the present supply is inadequate for the needs of the institution. The institution authorities are considering the development of a new source of supply, and to this end are sinking a test well on the flat near Cattaraugus creek, to the west of the institution. As a temporary expedient in order to provide a supply of water in case of fire, a pump has been installed near the Collins springs arranged to pump water from Clear creek into the receiving basin below the springs. The water from the main reservoir is pumped into the distribution system, the surplus going to a 110,000 gallon tank on a 100 foot tower.

Milk supply: The milk supply of the institution is obtained entirely from the institution herd of about 100 Holstein cows which have all been recently tuberculin tested. The cattle are kept in 3 stables, only 2 of which are of satisfactory construction. The cows are milked by patients. About 900 quarts of milk are produced daily, all of which is used raw.

Sewerage and sewage disposal: With the exception of the milk house all the buildings of the institution are served by a sewerage system which collects and conducts the sewage to a 20-inch combined sewer which discharges into Cattaraugus creek. The larger part of the sewers are arranged to keep the domestic and storm sewage separate; the trunk lines, however, carry combined sewage. The sewage from the milk-house is disposed of in a small plant consisting of settling tanks and a subsurface irrigation system.

Garbage and refuse disposal: The garbage from the institution is placed in covered galvanized iron cans and boxes at the main kitchen, and carted from there to the piggery twice a day where it is fed to the pigs. Infected garbage is burned on the dump, together with the inflammable refuse from the institution.

Recommendations

1. In regard to the water supply I would recommend:

(a) That on account of the obvious inadequacy of the yield of the present sources of supply and the possibility of the supply being accidentally or willfully polluted, a new source of supply of adequate quantity and unquestioned purity be developed without delay.

(b) That in view of the fact that the water of Clear creek is probably polluted, no water from this creek be pumped into the distribution system of the institution without first being sterilized.

2. In regard to the milk supply of the institution I would recommend:

(a) That additional stable facilities of suitable design be provided to relieve the present overcrowded condition, and that the building now used for the dry cows and young stock be remodeled to provide better light and ventilation.

(b) That all milk used at the institution be effectively pasteurized.

3. With reference to the sewage from the institution I would recommend that plans for the separation of the domestic and sanitary sewage, and the treatment of the domestic sewage in a suitable sewage disposal plant be prepared by the State Architect and submitted to this Department for approval as required by section 14 of the Public Health Law.

4. In regard to the disposal of the garbage I would recommend that the wooden boxes used as garbage receptacles be replaced by galvanized iron cans fitted with suitable covers.

COMSTOCK (Great Meadow Prison)

An investigation of the sanitary condition of the Great Meadow Prison at Comstock, Washington county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on May 27 and 28, 1920. Previous investigations of the sanitary condition of this institution were made in 1915 (see page 999 of the 36th Annual Report) and in 1917 (see page 652, Vol. II, of the 38th Annual Report). A special investigation of the water supply was made in 1909 (see page 240, Vol. II, of the 30th Annual Report), and a special investigation of the sewage disposal plant was made in 1916 (see page 789, Vol. II, of the 37th Annual Report). Plans for water supply were approved on October 25, 1909, and plans for sewerage and sewage disposal were approved on February 8, 1910.

Location: Town of Fort Ann, Washington county, near the unincorporated village of Comstock.

Site of institution: The prison is situated on gently sloping land near and draining into the Champlain canal. It is within one-half mile of the main line of the Delaware & Hudson railroad.

Area of grounds: 1,164 acres.

Number of occupied buildings: 16.

Capacity: 1,168 male inmates.

Present population: 468 male inmates, 69 employees, total 537.

Class of inmates: Male felons transferred from other institutions.

Water supply: The principal water supply of the institution is obtained from Dolph pond which impounds the runoff from the wooded area located about 2 to 4 miles northwesterly of the institution. A small auxiliary supply used principally for drinking is obtained from an artesian well located under the mess hall. In view of the location of this well and the lack of information as to the precautions taken toward preventing pollution, it is again recommended that the use of the water from the well be discontinued entirely in favor of the supply from Dolph pond. Water from a spring is piped to the grounds of the warden's residence where it is used for drinking purposes. A pumping plant is located on the shore of the Champlain canal which could be used in case of extreme emergency to pump water from the canal. Inasmuch as it is known that the water of the Champlain canal is grossly polluted, this Department believes that any connection between the water mains of the institution and the canal provides a potential source of danger.

Milk supply: The milk supply is obtained from the institution herd of about 50 cows. Conditions in the cow barn were found to be fairly satisfactory, and inasmuch as a new cow barn and milk room are under construction and it is expected that they will be ready for use this year, it is not deemed necessary to make recommendations for possible improvements.

Sewerage and sewage disposal: The sanitary sewage is collected in a separate sewer system and conducted to a sewage disposal plant. The plant consists of 2 grease traps, 2 settling tanks of the vertical flow type, 2 sludge drying beds, and a battery of 4 intermittent sand filters with dosing apparatus. The entire plant was found to be in an insanitary, ineffective, and deplorable condition. As a result of the clogging of the inlet pipe, the first tank had been by-passed. Owing to the fact that the dosing apparatus of the filter beds was out of order, it was the practice to blow off the entire contents of the second tank onto the sludge bed at intervals of one or two days. The sludge beds are in need of a complete overhauling. In a past report it has been recommended that the area of the sand filter beds be doubled. At the time of the investigation sewage was standing on two of the four filter beds to a depth of several inches, thus indicating the clogged condition of the beds. The dike around one of the filter beds had broken away at a point adjacent to the outlet manhole so that sewage was found to be flowing over the top of the bed and directly into a stream. While our engineer was on the ground, the work of uncovering the lines of underdrains of the filter beds was started. Sand and sludge had worked through the spaces in the tile and the troughs were nearly full of muck and sludge. The dilution of the effluent in the stream was small.

Refuge disposal: Garbage is collected in galvanized iron receptacles and transported to the piggery where it is fed to swine. Rubbish containing no waste subject to decomposition is carried to a distant point on the institution grounds.

Recommendations

1. That the old lumber and debris be removed from the site of the camp employed in the work of cleaning the reservoir as mentioned in the body of the report.

2. That the use of water from the artesian well be discontinued, and the water from the Dolph pond supply used exclusively until such time as definite information may be submitted regarding details of construction of the well and safeguards against its pollution, but that the well be maintained in such condition that it may be used at any time as an emergency supply.

3. That the care now exercised in the preservation of the purity of the Dolph pond supply be continued, and that inspections be made of the reservoir and watershed at regular and frequent intervals to prevent or forestall the creation of any possible source of pollution.

4. That the connection now existing between the pumping plant located on the bank of the Champlain Canal and the mains of the institution water system be discontinued, and that if it is desired to maintain an emergency fire protection a separate main in no way connected with the mains of the Dolph pond supply be laid from this pumping plant to separate fire hydrants.

5. That plans be prepared by the State Architect and submitted to this Department for approval showing arrangements to be made for the sewerage of the new cow barn and milk room now under construction in order that same may be ready for operation at such date as the buildings are ready for occupancy.

6. That all milk used be pasteurized by approved methods.

7. That the sewage disposal plant be repaired and put in service in accordance with the following recommendations, many of which have already been included in previous reports:

(a) That a screen chamber be installed as the first unit of the disposal plant, said screen to be so designed as to permit of easily raking the screenings onto a platform, and to be constructed in accordance with plans which should be prepared by the State Architect and receive the approval of this Department. That such a screen when placed in operation shall be cleaned daily, screenings to be disposed of in such a manner as not to create a nuisance or insanitary condition.

(b) That the sludge blowoff pipe of the first settling tank be cleaned, and if any structural defect is found to exist responsible for the persistent trouble experienced in the clogging of this pipe, that such defect be corrected.

(c) That a water pipe line be installed to the disposal plant and such connections made as will make possible the flushing out of the sludge blowoff pipes, the underdrains of the filters, and the cleaning of the settling tanks when necessary.

(d) That definite steps be taken to prevent the entrance of ashes and sand through any manhole or other sewer openings.

(e) That the sag in the sludge pipe crossing the brook bed be corrected and provision be made for the trussing of the pipe at this point, or other suitable means of support.

(f) That the sludge drying beds be thoroughly overhauled, which shall include —

(1) The removal of all grass from surface.

(2) Repair of dikes, protecting same with sheet piling if necessary.

(3) Thorough overhauling of the underdrainage system and installation of an underdrainage system in the smaller bed.

(4) Cleaning or removal of the sand as may prove necessary.

(5) Division of the larger bed into two beds.

(6) Installation of new distributing trough with facilities for running the sludge onto any single bed thus permitting better operation of same.

(g) That the siphons be overhauled, preferably by a representative of the manufacturer, and placed in such condition that their positive action and control is assured at all times, and that in the future at least three beds be used at all times, dosing to be in rotation by their respective siphons. If it is not possible to obtain satisfactory results with these siphons, that they be replaced by new siphons or by some other satisfactory type of siphon.

(h) That the same filter beds be thoroughly overhauled and repaired in the following respects:

(1) That the book tile of the drains be removed and cleaned.

(2) That the concrete troughs of the drains be cleaned.

(3) That the tile be relayed with ½-inch open joints.

(4) That gravel or broken stone be placed around the tile to a depth of 6 inches above the concrete troughs and extending a distance of at least 6 inches each side of the tile.

(5) That intermediate underdrains, properly covered with graded gravel, be placed between the existing underdrains.

(6) That the sand from the top of the bed be removed to a depth of 4 to 6 inches or more as may be necessary to arrive at a fairly clean sand, and that same be replaced with new sand.

(7) That the concrete wall around a portion of the beds now in bad state of repair be rebuilt and strenghtened as may be necessary to protect the beds from wash at times of high water and from slumping of adjacent clay soil onto the bed.

(8) That new distributing troughs be constructed or the old ones be placed in proper condition.

(9) That the fresh air vents be straightened and increased in height sufficient to avoid all possibility of any part of the sewage discharged onto the bed flowing directly through them to the underdrain.

(10) That if the number of inmates of the institution increase materially beyond the present population the beds be increased in size proportionally.

(i) That after the completion of the various changes enumerated above, careful and particular attention be given to the operation of the plant.

(j) That plans showing details of changes and additions made to the sand filter beds, not included in the original plans approved by this Department, be submitted for approval.

8. That the existing privy at the baseball field be abandoned and a privy of the removable container type, located further from the highway, be substituted for it.

9. That an effort be made to obtain galvanized iron garbage cans with suitable covers at the earliest possible date.

DANNEMORA (Clinton Prison and Dannemora State Hospital)

An investigation of the sanitary condition of Clinton Prison and Dannemora State Hospital, both located at Dannemora, Clinton county, was made by Mr. W. C. Emigh, assistant engineer in this Department, on June 1 and 2, 1920. Previous investigations of the sanitary condition of the institutions were made by this Department in 1915 (see page 1006 of the 36th Annual Report) and in 1917 (see page 653, Vol. II, of the 38th Annual Report). A special investigation of the water supply was made in 1918 (see page 197, Vol. II, of the 39th Annual Report). Plans for sewerage and sewage disposal were approved on January 28, 1910.

Location: Village of Dannemora, Clinton county.

Site of institutions: The institutions are situated at the foot of a mountain in the northern part of the village of Dannemora, and are reached from Plattsburg over the Plattsburg and Lake Placid branch of the Delaware and Hudson railroad. The natural drainage of the site is good.

Area of grounds: In the vicinity of the institution the prison owns 625 acres, but considerable other land in the surrounding country is owned or controlled by the prison. About 10 acres are included within the prison stockade. The area of the State Hospital lands is 134 acres.

Capacity: Clinton Prison, 1,600 male inmates. Dannemora State Hospital, 458 male inmates.

Present population: Clinton Prison, 960 men, 150 employees, total 1,110. Dannemora State Hospital, 520 men, 115 employees, total 635.

Class of inmates: Clinton Prison, male convicts. Dannemora State Hospital, criminally insane male convicts.

Number of occupied buildings: Clinton Prison, 16. Dannemora State Hospital, 10.

Clinton Prison

Water supply: The water supply of the prison consists of a principal supply from impounded surface streams and a number of auxiliary ground water supplies. There are two reservoirs on the main supply known as the upper and lower reservoirs, having capacities of about 1,500,000 and 1,000,000 gallons respectively. The reservoirs are located on a hill in the rear of the prison. At times this main supply is inadequate and resort is had to other sources. In the main prison inclosure there is an 8-inch driven well, 285 feet deep. On the elevated ground near the new tuberculosis hospital there is located a well originally sunk as a mine shaft to a depth of about 100 feet. There is a small covered concrete tank or basin located a short distance below this well or shaft which apparently receives the overflow from the latter. A socalled east line spring is located on another watershed and is piped into a plastered brick reservoir located below the cow barn. Another source of water supply used in the past and the use of which was discontinued owing to the freezing of the pipes last winter, is derived from an old abandoned mine. The water mains of the prison are also connected with the Dannemora village water mains and water from the village supply is occasionally used.

Milk supply: The milk supply is obtained principally from a herd of cows belonging to the prison, which at the time of the investigation numbered 35

head of cattle. The milking is done by inmates of the prison. A new milk room has been constructed. The milk is used without pasteurization.

Sewerage and sewage disposal: The sewerage system of the institution consists of lateral sewers, a trunk sewer, a screen chamber, and 4 settling tanks. As originally planned, the sewer system was designed to carry some storm water as well as sanitary sewage, but it appears that all storm water has now been eliminated from the system. The screen is of improper design, lacking in facilities for cleaning. At several points on the trunk sewer between the screen chamber and the settling tank, breaks in the sewer had occurred. At such points wooden boxes with removable covers had been built over the sewer which had not been otherwise repaired. The settling tank consists of 4 units operated in pairs and each pair operated in series. The sludge blow-offs were clogged. The effluent from the tank flows into a small stream which discharges into the Saranac river at a point about 5 miles distant.

Refuse disposal: Garbage is collected in wooden barrels without covers and conveyed to the piggery where it is fed to swine. Combustible rubbish is burned. Noncombustible rubbish is placed on a dump.

Dannemora State Hospital

Water supply: The water supply of the Dannemora State Hospital is obtained from the mains of the Clinton Prison system. The hospital has for some time had funds available for the purchase of a tract of land located on a mountain in the rear of the present property. There is a possibility that if this land were purchased by the State a water supply might be developed thereon, with suitable storage reservoirs sufficient to nearly if not entirely furnish the water supply of the hospital.

Milk supply: Approximately 25 per cent of the milk supply is obtained from the herd of 12 cows owned by the institution. The remainder is purchased from a local dairy. Neither the milk produced at the institution nor the purchased milk is pasteurized.

Sewerage and sewage disposal: The sewage of the hospital is discharged into the sewers of Clinton Prison.

Refuse disposal: Garbage is collected in wooden barrels and is fed to swine. Combustible rubbish is burned, and noncombustible rubbish is placed on a dump.

Recommendations

Clinton Prison:

1. In regard to water supply:

(a) That at the earliest possible date a thorough investigation be undertaken of possible sources of a new or additional water supply of adequate quantity and satisfactory sanitary quality, and that plans for such additional or new water supply be prepared by the State Architect and submitted to this Department for approval.

(b) That steps be taken properly to protect the mines or shafts from pollution due to surface wash, or that the use of water therefrom be discontinued entirely.

(c) That no water be used from the driven well until sources of of pollution are removed or the safe quality of water is assured.

(d) That ice cutting on reservoirs used for water supplies be discontinued.

2. In regard to the milk supply:

(a) That the milk be pasteurized by approved methods.
(b) That milking be done in small-top pails.
(c) That a drain be installed in the floor of the milk room.

3. In regard to the sewerage and sewage disposal:

(a) That a new screen chamber be provided under plans which should be prepared by the State Architect and submitted to and receive the approval of this Department. The screen should be so designed as to permit of easily raking the screenings onto a platform, and when placed in operation it should be cleaned daily and such disposal made of the screenings as not to create a nuisance or menace to health.

(b) That the storm water sewer be cleaned at the point now clogged near the present screen chamber, and that the connection between the screen chamber and the manhole on the storm water sewer be broken.

(c) That all breaks in the line of sewer be properly repaired.

(d) That at the point where the sewer now forms an open pond, such construction be undertaken as shall entirely correct this condition.

(e) That the settling tanks be thoroughly cleaned and that the sludge blow-off pipes be cleaned and kept in operating condition.

(f) That sludge drying beds be constructed of proper design, location, and capacity, from plans which shall have been approved by this Department.

(g) That plans for more complete treatment of the sewage of the institution be prepared and submitted for approval, and that the works provided by such plans be installed at as early a date as practicable.

4. In regard to the refuse disposal and general sanitation:

(a) That galvanized iron garbage barrels or cans with covers be supplied, and that after each emptying these barrels or cans be washed with hot water.

(b) That the intended removal of the piggery from its present location near the new tuberculosis hospital be effected as soon as possible.

Dannemora State Hospital:

1. That the hospital authorities cooperate with the prison authorities as far as possible in the investigation of and securing of necessary appropriations for a satisfactory joint supply of water.

2. In regard to the milk supply:

(a) That the institution authorities continue to make every effort possible to procure an appropriation for the erection of a new and modern cow barn, and to acquire sufficient additional pasturage to justify them in substantially increasing the hospital herd; and that until such time as this may be accomplished every effort be made to keep the quality of milk as safe as possible under existing conditions.

(b) That at the farm of Mr. Phillips such regulations regarding the handling of milk be enforced as are required of those who are selling milk in cities of this State.

(c) That milk be pasteurized at the hospital by approved methods.

3. That the institution be provided with galvanized iron garbage barrels or cans with covers, and that same be cleaned with hot water after each emptying.

FARMINGDALE (State Institute of Applied Agriculture)

An investigation of the sanitary conditions of the State Institute of Applied Agriculture at Farmingdale, Suffolk county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on July 8, 1920. A previous investigation of the sanitary condition of this institution was

made by this Department in 1917 (see page 630, Vol. II, of the 38th Annual Report); a special investigation of the water supply of the institution was made in 1915 (see page 1029, Vol. II, of the 36th Annual Report); and a special investigation of the sewage disposal plant was made in 1916 (see page 793, Vol. II, of the 37th Annual Report). Plans for water supply, sewerage and sewage disposal were approved on July 10, 1914; December 24, 1914; and May 29, 1915.

Location: On the boundary line of the town of Oyster Bay, Nassau county, and the town of Babylon, Suffolk county.

Nature of institution: A school for instruction in agriculture.

Area of grounds: 308 acres.

Site of institution: The school is situated about 1½ miles north of the village of Farmingdale which is on the main line of the Long Island railroad, about 33 miles from the Pennsylvania Railroad Station in New York city. The central portion of the school property is flat, the main drainage being from hills in the northeastern part of the property toward the southwest. The ground surface drops sharply to the Amityville-Huntington highway.

Number of occupied buildings: 7, exclusive of barns and other farm and accessory buildings.

Capacity: Boys 188, girls 20, employees 60, total 268. Present accommodations permit about half of the students to live on the grounds.

Present population: Boys 157, girls 6; total enrollment 163; employees 55; total population 218. It is expected that the incoming class will bring the total enrollment in the fall to the present capacity of the school.

Class of inmates: Students in agriculture.

Water supply: The main source of the institution water supply is an 8-inch driven well 111 feet deep. From the well water is raised by air lift to a covered concrete reservoir which is located near the power house. From the reservoir water is pumped to an elevated steel tank located about 2,000 feet from the power house, with a capacity of approximately 50,000 gallons. The water supply for two farm houses located on the institution property is derived from wells. From the bottom of a dug well at the Ruland farm a pipe has been driven to a depth 10 feet greater, from which depth water is raised. At the Seaman farm a new well has been driven about 40 feet deep and located 12 feet from the house.

Milk supply: The milk supply of the institution is obtained from the institution herd which numbered 29 at the time of the investigation. The herd was tuberculin tested in March, 1920. Milk is used without pasteurization.

Sewerage and sewage disposal: The surface water and sanitary sewage is collected in separate systems of sewers. Sewage is conveyed to a disposal plant consisting of coarse screens, settling tanks, a chlorination plant, and a subsurface irrigation field. The sewage after passing through the screens flows into a sump from which it is pumped to the settling tanks of which there are 3 of the Imhoff type. A sludge press which was installed in the pump house has never operated satisfactorily. Privies are in use at the Ruland and Seaman farm houses.

Refuse disposal: Garbage is removed from the kitchen daily and is fed to swine. Rubbish is burned on a dump. Paper is burned under the power house boilers.

Recommendations

1. In regard to the water supply:

(a) That the practice of throwing wash water on the ground in the vicinity of the wells at the Ruland and Seaman farms be discontinued.

(b) That the old well chamber at the Ruland farm be filled with earth at least as fine as that of the surrounding ground.

2. In regard to the milk supply:

That the milk produced at the institution be pasteurized by approved methods.

3. In regard to the sewerage and sewage disposal:

(a) That the ground around the manholes of the sanitary sewers be so graded as to preclude the possibility of surface water entering these sewers.

(b) That the automatic float control switches intended to operate the sewage pumps be removed to a location sufficiently dry to permit of satisfactory operation of this apparatus.

(c) That the baffles of the settling tanks be repaired or reconstructed.

(d) That in view of the failure of the sludge press to operate, plans be prepared and submitted to this Department showing a suitable sludge drying bed, together with method to be employed for the placing of the sludge from the settling tanks thereon, and that such beds be constructed at an early date.

(e) That the chlorinating apparatus be repaired or replaced at the earliest possible date.

(f) That the clogging of the subsurface irrigation field or leakage from the distribution mains be properly remedied.

(g) That the present privies at the Ruland and Seaman farm houses be replaced by fly proof privies of the removable container type located not less than 100 feet from the wells; and that provisions be made to conduct the wash water from these houses to properly located and designed cesspools.

FIRE ISLAND (State Park)

An investigation of the sanitary condition of the Fire Island State Park at Fire Island, Suffolk county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on September 1, 1920. Previous examinations of the sanitary condition of the park were made by this Department in 1914 (see page 1032, Vol. II, of the 36th Annual Report). A special investigation of the water supply of the institution was made in 1917 (see page 340, Vol. II, of the 37th Annual Report). Plans for water supply and sewerage and sewage disposal were approved on April 23, 1912.

Location: Fire Island, town of Islip, county of Suffolk, N. Y.

Site of institution: The park is situated on Fire Island, which lies at this point about 5 miles off the south shore of Long Island. It is located some 2 miles from Fire Island inlet, and about 6 miles from Bay Shore, from which it is reached by boat. The park extends from the Great South bay on the north shore of the island to the Atlantic ocean on the south shore.

Area of grounds: 120 acres.

Number of occupied buildings: Four cottages and a swimming pavilion. The permanent population through the summer consists of 4 or 5 employees and their families. The visiting population is said to average about 300 people per day through the months of July and August.

Water supply: The main source of water supply is from a dug well 5 feet deep located near the center of the park property. Water is raised from the well by a pump installed on the first floor of the building over the well to a tank located on the second floor. From the tank water is piped to several buildings on the park property. A shallow driven well located about 200 feet from an employee's cottage is used as a source of supply by the occupants of the cottage. A shallow driven well near the main boardwalk fitted with a pitcher pump was not in operating condition at the time of the investigation.

Sewerage and sewage disposal: Plans which were approved by this department for sewerage and sewage disposal show one large cesspool at the public toilet building and two smaller ones at the bathing pavilion. The public toilet building was destroyed by fire in 1917, and subsequently a large privy has been in use. The cesspools at the bathing pavilion were functioning properly. Two additional cesspools for which no plans had been submitted

to this Department have been constructed to care for the sewage from the park commissioner's cottage and the superintendent's cottage.

Refuse disposal: The garbage and rubbish, of which the greater part is left by picnic parties, is picked up by park employees and thrown into the waters of Great South bay.

Recommendations

1. In regard to water supply:

   (a) That the present well be filled in and a new well be constructed at a distance from the pumping plant of not less than 50 feet, the water to be drawn therefrom by the pumping equipment as located at present, and that this new well be adequately protected against contamination.

   (b) That fences be constructed inclosing an area not less than 100 feet square about each well, and that the public be excluded from the inclosed area.

2. In regard to the disposal of sewage:

   That all privies be abandoned, and water closets be provided where needed.

3. In regard to refuse disposal:

   That all garbage be buried, and all other combustible rubbish be burned at a suitable point and in such a manner as not to create a nuisance.

INDUSTRY (State Agricultural and Industrial School)

An investigation of the sanitary condition of the State Agricultural and Industrial School at Industry, Monroe county, was made by Mr. C. A. Howland, assistant engineer in this Department, on March 25, 1920. Previous investigations of the sanitary condition at the institution were made by this Department in 1911 (see page 988 of the 32nd Annual Report), in 1914 (see page 479, Vol. II, of the 35th Annual Report), and in 1918 (see page 525, Vol. II, of the 39th Annual Report). A special investigation of the sewage disposal plant was made in 1919 (see page 444, Vol. II, of the 40th Annual Report). Plans for water supply were approved on October 19, 1910; and plans for sewage disposal were approved on June 5, 1911.

Location: Industry, town of Rush, Monroe county, N. Y.

Site of institution: The institution is situated in the valley of the Genesee river, about 14 miles southwest of the city of Rochester. The grounds of the institution rise from an elevation of 530 feet above mean sea level at the river, to an elevation of about 620 feet at a point about one mile east of the river. The Rochester branch of the Erie railroad passes through the property, and the Industry station on that line is located near the main buildings of the institution.

Area of grounds: 1,432 acres.

Number of occupied buildings: About 50.

Capacity: 755 boys, 178 officers and employees, total 933.

Class of inmates: Male children between the ages of 12 and 16 years who shall be legally committed to such school by any court having authority to make such commitment.

Water supply: The water supply of the institution is taken from the municipal supply of the city of Rochester. An 8-inch pipe connects the 6-inch main distribution line of the institution with the Rush reservoir of the city water supply, and a connection also exists with the supply main from Hemlock lake to the city of Rochester.

Milk supply: The milk supply is obtained from 19 separate herds of cows maintained at the different colonies on the institution property. All cows have been tuberculin tested and are free from tuberculosis. The daily pro-

duction of milk at the time of the inspection was about 3,500 pounds. After as much milk as is needed for use at the colonies is distributed, the remainder is separated; butter is made from the cream and the skimmed milk is returned to the cottages. In the majority of cases the barns were found to be in a satisfactory condition of repair and to be carefully maintained.

Sewerage and sewage disposal: All of the occupied buildings of the institution are provided with toilet fixtures and the sewage is collected by several separate sewerage systems. Manholes have not been provided at every change of grade and alignment and trouble has been experienced with stoppages in some cases. Plans approved by this Department on June 6, 1911, show that the sewage of the institution is to be disposed of by means of 7 separate sewage disposal plants. Five of these plants have been constructed. All of the plants are of the same general type, each consisting of a settling tank, dosing tank, and sand filter. In 3 instances trenches are provided for the final disposal of the sludge. At the time of the inspection the sewage disposal plants were not in a satisfactory operating condition, and it appears that they have not been constructed entirely in accordance with the plans approved by this Department.

Refuse disposal: The garbage is stored in covered galvanized iron pails and is fed to hogs which are kept near many of the cottages. Combustible rubbish is burned, and noncombustible rubbish is placed on a dump.

Recommendations

1. That in view of the conditions surrounding the production of milk at the institution, the potentially infective character of milk, and the necessity of preventing the spread of infection from this source, arrangements be made effectively to pasteurize all the milk of the institution.
2. That the sewage disposal plants be reconstructed wherever necessary to conform to the plans approved by this Department.
3. That the sewage disposal plants be properly repaired wherever necessary and be operated efficiently throughout the entire year.
4. That all connections for the discharge of surface or roof water into the sanitary sewers be disconnected, and this water be discharged through properly constructed storm sewers into appropriate water courses.
5. That proper sewage disposal be provided in accordance with the plans approved by this Department or approved amendments thereof, for those buildings which are without sewage disposal.

IROQUOIS (Thomas Indian School)

An investigation of the sanitary condition of the Thomas Indian School at Iroquois, Erie county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on June 30, 1920. Previous examinations of the sanitary condition of the institution were made by this Department in 1911 (see page 996 of the 32nd Annual Report), and in 1914 (see page 850, Vol. II, of the 36th Annual Report), and in 1918 (see page 526, Vol. II, of the 39th Annual Report). A special investigation of the water supply of the institution was made in 1919. Plans showing certain details of additional water supply were approved on July 2, 1920, and July 27, 1920.

Location: Iroquois, Cattaraugus Indian Reservation, Erie county, N. Y.

Site of institution: The institution is situated in the valley of Cattaraugus creek, about 8 miles east of Lake Erie. The elevation of the ground at the site of the buildings is 650 feet above mean sea level, and about 80 feet above the level of Lake Erie. The nearest railroad station is Lawtons, which is on the Buffalo and Southwestern division of the Erie railroad, 27 miles south of Buffalo.

Area of grounds: 100 acres. An additional 165 acres is rented.

Number of occupied buildings: 11, not including barn, shop, and power house.

Capacity: 90 boys, 100 girls, 51 employees, total 241.

Present population: 95 boys, 100 girls, 49 employees, total 244.

Class of inmates: Destitute and orphan Indian children from any of the several Indian reservations in the State of New York.

Water supply: Four sources of water supply are available at the institution, of which 3 are in normal use. Water from a spring located on a steep hillside at a distance of about 1¼ miles from the institution buildings flows by gravity to the institution property. Two wells are in use, both of which are located in close proximity to the institution buildings. The newer well has but recently been placed in use, and at the time of the investigation water was pumped from this well by means of a temporary connection. A pond just east of the main buildings furnishes an auxiliary supply for fire protection. The pond is fed by surface water which is unquestionably polluted and unfit for domestic use.

Milk supply: The milk supply of the institution is obtained from the institution herd of 30 cows. The herd was tuberculin tested during the month of May, 1920. A new milk house has recently been constructed. The building is of brick, and in the basement are installed refrigeration and ice manufacturing plants. The milk room and two coolers are located on the main floor. The milk is used without pasteurization.

Sewerage and sewage disposal: The sewage of the institution is collected by a system of combined sewers and discharged without treatment into Cattaraugus creek, which stream empties into Lake Erie about 25 miles southwest of the city of Buffalo.

Garbage and refuse disposal: The garbage is removed from the kitchen after each meal to the piggery where it is fed to swine. Rubbish is placed on a dump.

Recommendations

1. In regard to water supply:

(a) That the permanent pumping equipment of the new well be installed and placed in operation at the earliest possible date.

(b) That provision be made for the deflection of the surface water from the vicinity of both the old and the new well, and that protection of the wells from trespassers be effected by fencing off the area around them as outlined in the body of this report.

(c) That in view of the fact that the present arrangement of piping near the pumps makes it possible for polluted water from the pond near the school building to be turned into the distribution system carrying the domestic water supply, and that in case of a large fire it would probably be necessary to use the same pumps which normally handle the domestic supply for pumping the polluted pond water, I would recommend that either the domestic and fire supplies be entirely separated, including the installation of a pump to be used for fire purposes only, or that an additional supply of pure water be developed and the use of the pond as an auxiliary source of supply be abandoned.

2. In regard to the milk supply:

(a) That in view of the conditions which exist in the old milk-room and the difficulty with which these conditions could be satisfactorily remedied, the new milk room be equipped and placed in use at the earliest possible date.

(b) That the milk used at the institution be pasteurized in accordance with approved methods.

3. In regard to disposal of sewage:

   That the question of treating the domestic sewage in a suitable plant before it is discharged into the creek be considered by the institution authorities, and that plans for the necessary changes in the sewerage system and for a suitable disposal plant be prepared and submitted to this Department for approval.

4. In regard to garbage disposal:

   That the garbage be removed from the vicinity of the kitchen promptly after each meal.

KINGS PARK (State Hospital)

An investigation of the sanitary condition of the Kings Park State Hospital at Kings Park, Suffolk county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on July 9 and August 30, 1920. Previous investigations of the sanitary condition of the institution were made by this Department in 1915 (see page 934, Vol. II, of the 36th Annual Report), in 1917 (see page 645, Vol. II, of the 38th Annual Report), and in 1919 (see page 425, Vol II, of the 40th Annual Report). Special investigations of the sewage disposal plant were made in 1916 (see page 666, Vol. II, of the 38th Annual Report), in 1918 (see page 546, Vol II, of the 39th Annual Report), and in 1919 (see page 446, Vol. II, of the 40th Annual Report). Plans for water supply were approved on August 31, 1915; August 22, 1918; and March 19, 1920; and plans for sewerage and sewage disposal were approved on December 29, 1908; July 28, 1912; and July 3, 1917.

Location: Kings Park, Suffolk county, Long Island, on the Wading River branch of the Long Island railroad, about 40 miles from New York city.

Site of institution: The institution is situated upon rolling ground on the shores of Smithtown bay, just west of the mouth of the Nissequoque river. The institution buildings are on ground well elevated above the bay, and the slope of the surface is such as to afford adequate natural drainage. The soil is sandy. The buildings are located about 1 mile from the north shore line of Long Island.

Area of grounds: 834.61 acres.

Number of occupied buildings: 63.

Capacity: Men 1,564, women 1,936; total inmates 3,500; employees 845; total capacity population, 4,345. A new cottage building now in construction will accommodate about 200.

Present population: Men 2,006, women 2,691; total inmates 4,697; employees 676; total present population, 5,373.

Class of inmates: All classes of insane except the criminal insane.

Water supply: The water supply of the institution is obtained from a battery of 10 deep wells located near the power house. The wells are driven through alternate strata of sand and clay and are said to average about 490 feet in depth. Water is raised from the wells to a sump by air lift. From the sump the water is pumped to an open reservoir at a distance of about 4,000 feet from the power house. The elevation of the reservoir is not sufficient to provide water for the buildings of group No. 1, and it is therefore necessary to employ a booster pump to supply these buildings. If the depth of water in the reservoir is increased beyond 6 feet, the rate of leakage equals the rate of pumping. Plans have been approved by this Department for a new reservoir at a greater elevation, but owing to lack of funds the construction had not been commenced at the time of the investigation.

Milk supply: A part of the milk supply is obtained from the institution herd of 52 head of cattle. The herd is tuberculin tested annually. Milking is done by inmates. In addition to the milk produced by the institution herd, 1,000 quarts of grade B pasteurized milk and 240 quarts of condensed milk are purchased daily. The milk produced at the institution is used without pasteurization.

Sewerage and sewage disposal: The sanitary sewage and storm water from the institution are for the most part collected in separate sewers. The sewage is conducted to a disposal plant consisting of coarse screens, settling tanks, a dosing tank, sprinkling filter, disinfection apparatus, final settling tanks, and sludge drying beds. A portion of the sewer between the main screen chamber and the settling tanks consists of duplicate lines of an inverted siphon. The settling tanks, the construction of one of which had not been completed at the time of the investigation, are of the Imhoff type. The distribution of settled sewage on the surface of the sprinkling filter is not satisfactory. A cesspool is provided to care for the sewage from the residence of the supervisor of the grounds.

Refuse disposal: A concrete garbage house is provided near each of the five main kitchens at the institution. Garbage is collected from these houses and transported to the piggery where it is fed to swine. Rubbish is burned in a wire cage in the woods beyond the piggery. Rags and papers are salvaged.

Recommendations

1. In regard to the water supply:

That added storage of sufficient capacity to furnish water at adequate pressure for fire protection be provided.

2. In regard to milk supply:

That all milk produced at the institution be pasteurized by approved methods.

3. In regard to sewerage and sewage disposal:

(a) That such recommendations of the report of this Department dated August 18, 1919, on a special investigation of the sewage disposal plant, as have not been carried out be complied with at the earliest possible date.

(b) That the nozzles now in use for the distribution of sewage on the sprinkling filter be replaced by nozzles throwing a broader spray, or that an additional distribution main for the sprinkling filter be installed, or that other means be found to overcome a sufficient portion of the loss of head now occurring in the existing distribution system to effect a better distribution of sewage.

(c) That the toilet at the piggery and the sewer leading therefrom be installed at the earliest possible date.

4. In regard to disposal of refuse:

(a) That care be exercised to keep all barrels used for the collection of garbage covered at all times.

(b) That the doors of the garbage house be kept closed.

(c) That the floors of the garbage house be washed daily.

(d) That as little garbage and bones as possible be stored at the piggery, and that such quantities as it may be necessary to store be covered and rendered inaccessible to flies.

MIDDLETOWN (State Homeopathic Hospital)

An investigation of the sanitary condition of the State Homeopathic Hospital at Middletown, Orange county, was made by Mr. C. A. Howland, assistant engineer in this Department, on January 30, 1920. Previous investigations of the sanitary condition of the institution were made by this Department in 1915 (see page 940, Vol. II, of the 36th Annual Report) and in 1918 (see page 527, Vol. II, of the 39th Annual Report).

Location: Middletown, Orange county.

Site of institution: The main buildings of the institution are located on elevated ground in the northwestern part of the city of Middletown. The surface of the ground slopes away from the main group of buildings in all

directions, affording good drainage; and the drainage of the other parts of the institution property is apparently good.

Area of grounds: 540 acres.

Number of occupied buildings: 23.

Capacity: 616 men, 1,224 women, 475 employees, total 2,315.

Present population: 759 men, 1,334 women, 367 employees, total 2,460.

Class of inmates: Insane except criminal insane, from the counties of Orange, Rockland, Sullivan, and Ulster, and patients from any part of the State for whom homeopathic treatment is desired.

Water supply: The entire water supply of the institution is obtained from the public water supply of the city of Middletown, which is derived from two sources, namely, Highland lake and Monhegan lake. The wells which were previously used at the institution and which were found to be subject to contamination have been abandoned, in accordance with the recommendations of this Department. The city water supplies from both sources are treated by coagulation and are filtered, the water from Highland lake through pressure mechanical filters and that from Monhegan lake through gravity mechanical filters. The higher buildings are supplied from the Monhegan lake (lower pressure supply) by pumping, and the lower buildings are supplied directly from the Highland mains. The systems are separate, except for a cross connection at the power house, which is ordinarily kept closed. The water is pumped into an iron storage tank of 9,355 gallons capacity located in the tower of the main building, and into a similar tank of 6,840 gallons capacity located at a lower elevation in pavilion 1.

Milk supply: The milk supply is obtained partially by purchase and partially from the institution herd. Raw milk is purchased under a contract from local dealers of Middletown or vicinity. During 1919 an average of 1,080 quarts per day was so purchased. The institution herd, which at the time of the inspection consisted of 93 cows, was tested for tuberculosis in September, 1919, and the tubercular cattle were killed. The milking is done by hand twice a day, and inmates are employed in this work. A 300-gallon pasteurizer of the batch type is installed in the creamery room at the main building. The pasteurizer was not in use at the time of the inspection, and had not been used since May 5, 1919, because no ice was available for cooling the milk after pasteurization. When the equipment is used, both the purchased milk and the milk produced at the institution are pasteurized.

Sewerage and sewage disposal: The sanitary sewage of the main part of the institution is collected by a system of sanitary sewers and discharged into city sewers in West Main street and Monhegan avenue. The sewage from the power house, the kitchen sinks, and toilet of the kitchen building of the west group is conveyed to a pumping plant near the power house. A detritus chamber is located near the greenhouse, in the West Main street sewer. A cesspool has been constructed for the disposal of the sewage from the florist's cottage. A second cesspool has been provided at the contagious cottage for sewage from the bathtub and sink. The sewage from about 30 people at the Comfort farm is discharged into a tight metal settling tank from which it flows into a subsurface irrigation system.

Refuse disposal: Garbage is stored in galvanized iron cans from which it is collected daily and taken to the piggery where it is fed to swine. Rubbish is collected daily and placed on a dump, where the combustible rubbish is burned in an open fire. Rags and papers are salvaged and sold.

Recommendations

1. That all the milk used at the institution be properly pasteurized, and that the recommendations of the report of this Department of February 11, 1918 in regard to the methods of operating the pasteurizer, be carried out.

2. That a thorough study be made of the existing sewerage system of the institution, and that plans be prepared showing the existing sewerage system and sewage disposal works with such modifications and alterations

as may be necessary to provide a comprehensive system of sewerage and sewage disposal works for the entire institution, and that this study be made at once in order that the sewage of the east group may be satisfactorily incorporated.

3. That the garbage and rubbish cans be kept covered at all times.

MORRISVILLE (State School of Agriculture)

An investigation of the sanitary condition of the New York State School of Agriculture at Morrisville, Madison county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on June 18, 1920. Previous examinations of the sanitary condition of this institution were made by this Departcent in 1910 (see page 748, Vol. II, of the 32nd Annual Report), in 1914 (see page 1035, Vol. II, of the 36th Annual Report), and in 1918 (see page 529, Vol. II, of the 39th Annual Report). Plans for water supply were approved on October 20, 1914; and plans for sewerage and sewage disposal were approved on August 31, 1911, and January 20, 1919.

Location: Village of Morrisville, Madison county, N. Y.

Site of institution: The village of Morrisville lies in the valley of Callahan brook about 2½ miles west of the Morrisville station of the New York, Ontario and Western railroad. The institution is situated in the eastern part of the village, occupying the original county buildings of the county of Madison. The elevation of the ground at the main institution buildings is about 40 feet above the brook and about 1,320 feet above mean sea level. On each side of the valley the hills rise to an elevation of about 1,700 feet above sea level.

Area of grounds: 250 acres.

Number of occupied buildings: 5, not including the barns and accessory buildings.

Capacity: 200 students of both sexes.

Present population: 64 men, 15 women, 26 employees; total, 105. It is anticipated by the school authorities that the enrollment of the incoming class in the fall will increase the total student body to approximately 125. Of this number only a small proportion, about 10 per cent, live on the institution grounds.

Class of inmates: Students in agriculture.

Water supply: The water supply of the institution is derived largely from 3 springs located on property owned by the institution at a distance of about one-half mile from the main school buildings. Water from the spring chambers flows by gravity to a covered concrete storage reservoir, and from the reservoir to the school buildings. In addition to this source of supply, the municipal supply of the village of Morrisville is connected with the institution system in the cellars of several of the buildings. The village supply is derived from a reservoir located about one mile west of the village, which is largely fed by springs, and in addition receives surface drainage from a considerable area.

Milk supply: The institution owns a herd of 13 milch cows which had been tuberculin tested a few weeks previous to the investigation. Since very few of the students live at the school, only a small portion of the milk produced by the herd is consumed there. The milk is not pasteurized.

Sewerage and sewage disposal: Sewage from the main buildings of the institution is conducted through a coarse screen chamber to the sewage disposal plant, which consists of a settling tank, a dosing chamber, and a subsurface irrigation field. A second sewage disposal plant has been provided near the dairy barn to care for the drainage from the fixtures in the barn, the milk room, and administration building. The plant is located under a driveway and is completely buried. As shown on the plans, the plant consists of a circular concrete cesspool or settling tank and a subsurface irrigation field.

Refuse disposal: Such small amounts of garbage as result from the meals prepared at the dormitory are removed daily by a farmer residing a short distance from the school. Refuse and ashes are used to fill in low ground.

Recommendations

1. In regard to the water supply:

(a) That the institution authorities consider the matter of purchasing additional land to the north and east of the institution springs in order better to protect the supply from possible contamination due to the pollution of the surface of the ground in the vicinity.

(b) That diverting ditches be constructed as outlined in the body of this report designed to convey surface wash from the adjoining property away from the springs.

(c) That the open spring be protected with a closed concrete screen chamber.

(d) That a lock be provided for the present collecting basin and that the basin be kept locked at all times.

(e) That as far as possible the institution supply be used for all purposes with the exception of boiler feed water.

2. In regard to the sewage disposal plant:

(a) That the drainage system be uncovered at the point where sewage now appears on the surface, and that such repairs be made as shall prove necessary to remedy that condition.

(b) That the vents of the subsurface irrigation system be repaired and maintained in proper condition.

(c) That the valves now covered be unearthed and the valve boxes be replaced.

(d) That the automatic dosing siphon be maintained in operating condition at all times.

NAPANOCH (Eastern New York Reformatory)

An investigation of the sanitary condition of the Eastern New York Reformatory at Napanoch, Ulster county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on July 6, 1920. Previous examinations of the sanitary condition of this institution were made by this Department in 1911 (see page 1003 of the 32nd Annual Report), in 1914 (see page 480, Vol. II, of the 35th Annual Report), in 1918 (see page 530, Vol. II, of the 39th Annual Report), and in 1919 (see page 426, Vol. II, of the 40th Annual Report). Plans for sewerage and sewage disposal were approved on September 27, 1912, and February 28, 1913.

Location: At Napanoch, Wawarsing township, Ulster county, N. Y.

Site of institution: The reformatory is situated on a flat area east of Rondout creek nearly opposite the village of Napanoch and at the foot of the Shawangung mountains. The institution grounds are about 280 feet above sea level and slope gently toward the creek. To the east the land rises steeply to an elevation of 2,200 feet, the institution property extending up this slope to an elevation of 1,200 feet. The soil in the vicinity is sandy and apparently well drained.

Area of grounds: 312 acres, of which 57 acres are tillable.

Number of occupied buildings: 8, including barn.

Capacity: 496 male inmates, 44 employees, total 540.

Present population: 205 male inmates, 40 employees, total 245.

Class of inmates: Males between the ages of 16 and 30 convicted of a felony, who have not been previously convicted of any crime punishable by imprisonment in a state prison. The institution receives the surplus population of the State Reformatory at Elmira, in connection with which it is maintained.

Water supply: The water supply of the institution is obtained from a small reservoir formed by a concrete dam across a narrow valley located on a mountain side in the rear of the reformatory. The watershed tributary to the reservoir has an area of about three-quarters square mile, is unpopu-

lated, and is entirely covered with woods. The reservoir is fed largely by springs. To permit an uninterrupted supply at the time of cleaning the reservoir, an auxiliary intake is located a short distance above the main reservoir and a by-pass around the reservoir is installed. The intake at the main reservoir is located in close proximity to the up-stream face of the main dam. It consists of a vertical castiron pipe riser surmounted by a cylindrical strainer, which latter is about 10 feet above the bottom of the reservoir and 20 feet below the crest of the dam. Considerable trouble has been experienced in the past owing to the entrance of sand into the pipes and the lodging of leaves against the strainer.

Milk supply: The milk supply for the institution is obtained from a local dairy. It is used without pasteurization.

Sewerage and sewage disposal: The sanitary sewage of the institution is collected in a separate system of sewers and conducted to the disposal plant consisting of a gate chamber, 2 open settling tanks, a sludge bed, siphon dosing chamber, and a 4-unit sand filter. Trouble has been experienced in blowing off the sludge from the settling tanks owing to the presence in the tanks of articles of discarded clothing and various forms of refuse introduced into the sewers by the inmates. Work has been in progress for several years looking toward the installation of inside toilet fixtures in all cells of the northerly cell block, thus making it possible to do away with the bucket system. At the time of the inspection the number of inmates was such that it was possible to use only cells equipped with toilet fixtures.

Refuse disposal: The garbage is collected in galvanized iron receptacles and is transported to the piggery, where it is fed to swine. Nonedible portions of garbage, together with rubbish, are burned on a dump near the disposal plant. Infected garbage and refuse from the hospital ward are burned under the boilers at the power plant. Rags and papers are salvaged.

Recommendations

1. In regard to water supply:

(a) That plans be prepared by the State Architect and submitted to this Department for a gate chamber or a modified intake as outlined in the body of the report.

(b) That the accumulation of gravel near or above the submerged dam be removed in order that there may be a decrease in velocity of the entering water sufficient to cause deposition of the greater part of the sand above this submerged dam.

(c) That care be exercised to protect the water supply from contamination by trespassers upon the watershed.

2. In regard to the sewage disposal plant:

(a) That a properly constructed coarse screen be installed in the gate chamber as outlined in the body of this report.

(b) That the present unsuitable material on the northerly unit of the filter bed be removed, and that sand suitable for use as a filtering medium be obtained and placed in these units.

(c) That when the filtering material on these units is changed the underdrains be cleaned.

(d) That in cleaning the sand beds, the scum and clogged sand be removed prior to the use of any mechanical implement for the loosening of the surface sand.

(e) That great care be exercised to maintain level surfaces on the sand filter beds.

3. In regard to the disposal of garbage:

That the receptacles used at the time of the investigation for the collection of garbage be replaced by galvanized iron garbage barrels with covers.

NEWARK (State School for Mental Defectives)

An investigation of the sanitary condition of the State School for Mental Defectives at Newark, Wayne county, was made by Mr. C. A. Howland, assistant engineer in this Department, on January 15, 1920. Previous investigations of the sanitary condition of this institution were made by this Department in 1911 (see page 1010 of the 32nd Annual Report), in 1915 (see page 835, Vol II, of the 36th Annual Report), and in 1917 (see page 634, Vol. II, of the 38th Annual Report). Plans for a filter plant to treat the water pumped from the Barge canal at the institution were approved on November 27, 1916; and plans for modifications in water main connections were approved on March 3, 1917. In May, 1917, plans for slight modifications in the arrangement of the piping system connected with the filters were approved. Plans for sewerage and sewage disposal were approved on April 3, 1907; July 13, 1909; March 10, 1913; and October 10, 1913. The institution was visited on July 26, 1916, by a representative of this Department to make an inspection in regard to proposed changes in the water supply.

Location: Village of Newark, Wayne county.

Site of institution: The institution is located on a hill just east of the village of Newark, at the south side of the Ganargua creek valley, which extends east and west at this point. Passing through the valley are the tracks of three steam railroad systems, an electric railroad, and the Barge canal. The ground slopes of the institution property appear to afford adequate drainage.

Area of grounds: 106 acres.

Number of occupied buildings: 15 (one cottage for inmates under construction).

Capacity: 1,050 women, 141 employees, total 1,191.

Present population: 984 women, 120 employees, total 1,104.

Class of inmates: Indigent feeble-minded women of child-bearing age who are residents of the State.

Water supply: The water supply for domestic use at the institution is obtained from a spring, and water for fire protection, boilers, laundry, and hot water service is pumped from the Barge canal and treated by coagulation with alum and by mechanical filtration. The spring water system is also connected with the water system of the village of Newark, and has been entirely disconnected from the Barge canal supply. The supply taken from the village of Newark is metered, but has not been used for about two years. The spring water supply flows by gravity to a sump from which it is pumped directly into the domestic water supply, the excess water discharging into an elevated steel tank. The Barge canal water is pumped from an intake in the canal to a reservoir of 1,000,000 gallons capacity. A considerable seepage takes place from this reservoir, but no tests have been made accurately to determine the amount. From the reservoir the water flows by gravity to a filter plant located in a separate building near the power house. The filter is provided with accessories, including a coagulation basin and a clear water basin. Cisterns are located in the basements of the various buildings, and these receive rain water from the roofs and excess water from the Barge canal supply.

Milk supply: The milk supply is purchased from two local milk dealers under contract. About 500 quarts of grade B raw milk are used daily.

Sewerage and sewage disposal: The sanitary sewage of the entire institution, with the exception of the power plant, is collected by a system of sanitary sewers and discharged into the sewerage system of the village of Newark. It appears that during the past three years the sewerage system has been practically rebuilt, and that no trouble from clogging of the sewers has occurred in the reconstructed system. Cesspools into which the sewage previously discharged have been eliminated from the system. The storm water at the main buildings is discharged into cisterns, while at 4 of the new buildings storm water is discharged into the reservoir of the hot water supply. The storm water and other waste water from the power house,

including the wash water from the filter plant, the blow-off of the boilers, and the sanitary sewage from the flush closet, wash sink, and spray bath, are discharged onto low land on the institution property.

Refuse disposal: Garbage is stored at the kitchens in covered galvanized iron cans. It is collected twice a day and taken to the piggery, where it is fed to swine. Rubbish is placed on a dump, where it is used for filling a ravine.

Recommendations

1. That all parts of the filter plant of the hot water system, such as the loss of head gauge and the turbine water meter, be placed in service.

2. That the rate of application of the alum to the water before filtration be made, not only in accordance with the volume of water treated, but also in accordance with the amount of turbidity and color in the water which is treated, more alum being added for higher turbidity and color.

3. That the existing reservoir of the hot water system be made watertight, or that a new reservoir of proper design and construction be provided for storing this water.

OGDENSBURG (St. Lawrence State Hospital)

An investigation of the sanitary condition of the St. Lawrence State Hospital at Ogdensburg, St. Lawrence county, N. Y., was made by Mr. C. A. Howland, assistant engineer in this Department, on September 25, 1919. Previous examinations of the sanitary condition of this institution were made by this Department in 1915 (see page 953 of the 36th Annual Report), and in 1917 (see page 647 of the 38th Annual Report).

Location: Ogdensburg, St. Lawrence county.

Site of institution: The hospital is located about 3 miles northeast of the center of the city of Ogdensburg, on a point of land which extends into the St. Lawrence river. The general contours of the land are such that the drainage is good, and in fact the institution appears to be quite satisfactorily located.

Area of grounds: 1,219.25 acres.

Number of occupied buildings: 55.

Capacity: 850 men, 1,100 women, 442 employees, total 2,392.

Present population: 1,010 men, 1,257 women, 406 employees, total 2,673.

Class of inmates: All classes of insane except the criminal insane.

Water supply: The principal water supply of the institution is obtained from the public water supply of the city of Ogdensburg. In addition to this supply, a pumping plant is maintained on the banks of the St. Lawrence river to pump water from the river in case of fire. The fires under the boilers at the pumping plant are banked and maintained in readiness for use at any time. There is no doubt of the dangerous pollution of the St. Lawrence river at this point by sewage from Ogdensburg, the central part of which is about 3 miles up-stream from the institution, and by sewage from other sources. A separate system of mains has not been provided at the institution for fire service. The water supply for the laundry and for the boilers is treated in a water softener of the type constructed by the L. M. Booth Company of New York. If this pumping plant were operated in an emergency, the institution system would therefore be filled with polluted water.

Milk supply: The milk supply of the institution is obtained from a herd owned by the institution, consisting of 202 head of cattle. The cows are tuberculin tested yearly. Milking machines are used, but it is necessary for a man to follow the machine and complete the milking. Inmates are employed for this purpose and for the work about the cow barn. The milk is used without pasteurization.

Sewerage and sewage disposal: The sewage and storm water of the institution are collected by a system of combined sewers and are discharged into the St. Lawrence river without treatment. A sewer from the garden cottage discharges directly into the St. Lawrence river. The main outlet is located at the end of the point on which the institution stands. A sewer screen consisting of round iron rods arranged in the shape of a trough is located in the manhole near the Flower building.

Refuse disposal: The garbage of the institution is stored at the several buildings in galvanized iron cans, from which it is collected twice each day and conveyed to the piggery, where it is fed to swine. Rubbish is placed on a dump, where the combustible portion is burned. Rags and papers are salvaged.

Recommendations

1. That the use of the St. Lawrence river water by pumping from the river at the institution be discontinued, and arrangements be made to supply the institution, if necessary, with water of safe sanitary quality and adequate quantity and pressure at such times as the city water is inadequate in quantity or pressure.
2. That in view of the insanitary conditions caused in the cow barn by leakage from the horse stable above, the use of the second floor of the cow barn as a horse stable be discontinued as soon as possible and the ceiling of the cow barn be repaired.
3. That in view of the conditions surrounding the production of milk for the institution, the potentially infective character of milk, and the necessity of preventing the spread of infection from this source, arrangements be made effectively to pasteurize the milk supply of the institution.
4. That the garbage be stored in covered containers both at the kitchens and at the piggery, and that adequate drainage be provided for the piggery.

OXFORD (State Women's Relief Corps Home)

An investigation of the sanitary condition of the New York State Women's Relief Corps Home at Oxford, Chenango county, was made by Mr. C. A. Howland, assistant engineer in this Department, on March 12, 1920. Previous investigations of the sanitary condition of the institution were made by this Department in 1911 (see page 1020 of the 32nd Annual Report), in 1914 (see page 482, Vol. II, of the 35th Annual Report), and in 1917 (see page 636, Vol. II, of the 38th Annual Report). A special investigation of the water supply was made in 1910 (see page 572 of the 31st Annual Report). Plans for auxiliary water supply were approved on August 31, 1915, and plans for sewage disposal were approved on April 4, 1916.

Location: Town of Oxford, Chenango county, about one mile east of the center of the village of Oxford.

Site of institution: The institution property is located on the eastern slope of the Chenango river valley. The main buildings stand on a plateau about one-quarter of a mile from the river at an elevation of 75 feet above the river, while the farm buildings are located about 400 feet east of the main buildings, and the power plant and laundry are adjacent to the Delaware, Lackawanna and Western railroad tracks in the valley. The ground slopes are apparently sufficient to provide adequate drainage for the institution property.

Area of grounds: 177.5 acres.

Number of occupied buildings: 20.

Capacity: 220 inmates, 63 employees, total 283.

Present population: 22 men, 134 women, 59 employees: total 215.

Class of inmates: Aged dependent veterans and their wives, veterans' mothers and widows, and army nurses, if residents of the State of New York.

Water supply: The greater part of the water supply is obtained from 16 springs located on a hill east of the institution buildings. The water from these springs flows into the upper of two reservoirs, which in turn overflows into the lower reservoir. Only 5 or 6 of the springs yield water throughout

the year. Water from an elevated tank of the Delaware, Lackawanna and Western railroad is used in the boilers and laundry and is pumped into the lower reservoir. A well for which plans were approved by this Department on August 31, 1915, has been driven between the upper and lower reservoirs. An intake pipe has been laid from the Chenango river to a concrete and brick suction chamber near the power house from which water may be pumped in case of fire. Water is supplied to the house of the head farmer and to the cow barn from two separate springs.

Milk supply: The milk supply is derived from the institution herd of 16 cows, all of which have been tuberculin tested, and all of which are tubercular. The milking is done by employees of the institution. The milk is pasteurized in a bulk pasteurizer made by the Creamery Package Manufacturing Company.

Sewerage and sewage disposal: The sewage treatment plant, consisting of a screen, Imhoff tank, sludge bed, and chlorination building, has been completed and placed in operation, with the exception that the chlorinating apparatus has not been installed. The effluent of the plant is discharged into the river through an outlet about 30 feet from the southerly bank at a point below the intake of the auxiliary water supply.

Refuse disposal: Garbage is stored in galvanized iron cans and is collected twice daily and taken to the piggery where it is fed to swine. The rubbish is disposed of on a dump located in the rear of the barn, and at the time of the inspection garbage was observed on this rubbish pile and also the entrails of slaughtered animals. Combustible refuse is burned on the dump.

Recommendations

1. That analyses be made of the water from the drilled well between the upper and lower reservoirs after a continuous period of pumping sufficient to eliminate the pollution due to not using the well, and if it be found that the water is of safe sanitary quality, the auxiliary water supply from the Delaware, Lackawanna and Western railroad water tank be abandoned, and water from the well be used to supplement the spring supply.
2. That the springs be properly protected against contamination by surface water and be surrounded by fences enclosing them and the land draining toward them.
3. That the auxiliary water supply obtained directly from the Chenango river be abandoned.
4. That the pasteurizer be thoroughly cleaned each time after use, and that it be sterilized with steam both before and after use.
5. That as soon as practicable a properly designed and constructed milk house be provided.
6. That the accumulation of scum in the settling compartment of the Imhoff tank be prevented, the sides and bottom of the settling compartment be scraped downward toward the slot to remove material adhering to them, the accumulation of scum in the gas vent be prevented by breaking it up and allowing it to settle or removing it to the sludge bed. and that only the thoroughly digested sludge be removed from the sludge compartment of the settling tank to the sludge bed during the summer at intervals of not less than one month for the present daily sewage flow at the institution.
7. That the screens be raked at sufficiently frequent intervals to prevent clogging of the screens and the screenings be disposed of by proper burial at a point where a water supply will not be contaminated.
8. That a chlorination apparatus for the treatment of the effluent from the Imhoff tank be installed as soon as the necessary appropriation can be secured. and that the chlorine be applied to the sewage at a rate of not less than 10 parts by weight of liquid chlorine to one million parts of sewage treated.
9. That no garbage or other putrescible organic matter be deposited on the rubbish dump, which should be located as far as practicable from

the institution buildings, and that such putrescible organic matter be disposed of by proper burial or other sanitary means.

10. That adequate drainage and ventilation be provided for the piggery.

POUGHKEEPSIE (Hudson River State Hospital)

An investigation of the sanitary condition of the Hudson River State Hospital at Poughkeepsie was made by Mr. C. A. Howland, assistant engineer in this Department, on April 7 and 8, 1920. Previous investigations of the sanitary condition of the institution were made by the Department in 1914 (see page 957, Vol. II, of the 36th Annual Report) and in 1918 (see page 531, Vol. II, of the 39th Annual Report). Special investigations of the water supply of the institution were made in 1914 (see page 267, Vol. II, of the 35th Annual Report) and in 1916 (see page 562, Vol. II, of the 37th Annual Report). Plans for improvements and additions to the water supply were approved by this Department on June 19, 1912; November 22, 1912; April 30, 1914; January 17, 1918; April 29, 1919; and March 20, 1920.

Location: Poughkeepsie, Dutchess county, N. Y.

Site of institution: The property of the institution is situated on the east bank of the Hudson river about 3 miles north of the city of Poughkeepsie. The topography is rather irregular. The elevation of the ground surface varies from 0 at the river to 468 feet about 1¾ miles east of the river. Back of this point the land falls away again to Fallkill creek. The soil is in general a mixed sand and clay.

Area of grounds: 893.58 acres.

Number of occupied buildings: 5 main buildings or groups and 8 cottages occupied by patients, 5 buildings occupied by officers, 7 farm houses, a power house, pumping station. and the usual farm and accessory buildings.

Capacity: 1,275 men, 1,587 women, 680 officers and employees, total 3,530.

Present population: 1,586 men, 1,956 women, 565 officers and employees, total 4,107.

Class of inmates: All classes of insane except the criminal insane.

Water supply: The main water supply of the institution is obtained from the Hudson river, and is treated by coagulation with alum, filtration through slow sand filters, and chlorination before being distributed to the buildings. The construction of a new intake, for which plans have been approved by this Department, has been begun. The water obtained through the old intake pipe is treated with alum by means of a dry feed apparatus, after which it is pumped into a coagulation basin from which it flows by gravity to two covered slow sand filters. An additional filter unit which had been constructed had caved in and will have to be rebuilt. A Wallace & Tiernan siphon feed chlorinator has been installed to chlorinate the effluent of the filters. The engineer was informed that the usual rate of chlorine application was about 0.9 parts per million, the rate having been increased after the occurrence of a number of cases of gastroenteritis at the institution. After chlorination the water flows into a subterranean concrete clear water well from which it is pumped to the storage reservoir just above the central group. A number of buildings which are too high to be supplied from the main reservoir are furnished with water by pumping directly into the mains of these buildings. There are 3 institution farms, 2 of which are supplied with well water and the third with water from a cistern.

Milk supply: The milk supply of the institution is obtained partly from the institution herd of 54 cows and partly by purchase from local dairies. About 500 quarts per day were being produced at the institution at the time of the inspection, and about 1,800 quarts per day were being purchased. The largest part of the purchased milk is delivered at the main kitchen, but about 280 quarts are delivered each day directly by the farmers to 8 cottages. No provision is made for pasteurizing either the milk produced at the hospital or the purchased milk.

Sewerage and sewage disposal: The domestic sewage of the institution is collected by a system of sanitary sewers and discharged directly into the Hudson river without treatment. The point of discharge is between the intakes of the water supply of the city of Poughkeepsie and of the Hudson River State Hospital, and so close to them that it has been possible to trace solid matter from the sewer outlets by the eye to both intakes. The grades of the sewers are in general satisfactory, and manholes are provided at frequent intervals for inspecting and cleaning the sewers. Screens are provided in the laterals from the different buildings to intercept any rags or other material which the patients may introduce into the sewers through the fixtures. The sewage from 3 cottages flows into a receiving well from which it is pumped into the gravity sewer system. At the farm houses and dairy barn and at some of the more remote buildings, privies are used.

Refuse disposal: The garbage is stored in wooden barrels or galvanized iron cans from which it is collected daily. Part of the garbage is fed to swine kept by the institution and the remainder sold to farmers. Waste paper and rags are salvaged, and rubbish is placed on a dump on the institution grounds.

Recommendations

1. That liquid chlorine be applied to the filter effluent at all times in such quantities as to produce a safe water for domestic consumption, and that the rate of application necessary effectively to sterilize the effluent from the filters be determined by careful observation.
2. That in order to provide for the continuous chlorination of the water supply a duplicate chlorinating apparatus be installed.
3. That satisfactory water supplies be provided at the Travers, Moore, and Winslow farms, either by the extension of the mains of the present general system or by the development of other supplies from satisfactory sources.
4. That the dairy barn be remodeled and put in a satisfactory sanitary condition, or if necessary a new barn be constructed.
5. That in view of the conditions surrounding the production of milk for the institution, the potentially infective character of milk, and the necessity for preventing the spread of infection from this source, arrangements be made effectively to pasteurize all milk used at the institution.
6. That a suitable sewage disposal plant for the treatment of the domestic sewage of the institution before it is discharged into the Hudson river be provided as soon as practicable.
7. That before a sewage disposal plant is constructed, all connections for the discharge of roof or other storm water into the sanitary sewers be disconnected, and the storm water be discharged into properly designed and constructed storm sewers.
8. That wherever possible the present privies be abandoned, and that those privies which it may be found necessary to retain be properly screened and be kept in a sanitary condition.

RAYBROOK (State Hospital for the Treatment of Incipient Pulmonary Tuberculosis)

An investigation of the sanitary condition of the State Hospital for the Treatment of Incipient Pulmonary Tuberculosis at Raybrook, Essex county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on June 3, 1920. Previous examinations of the sanitary condition of this institution were made by this Department in 1915 (see page 867 of the 36th Annual Report) and in 1917 (see page 637, Vol. II, of the 38th Annual Report). A special investigation of the water supply was made in 1917 (see page 493, Vol. II, of the 38th Annual Report); and special investigations of the sewage disposal plant were made in 1910 (see page 506 of the 31st Annual Report) and in 1916 (see page 830, Vol. II, of the 37th Annual

Report). Plans for sewerage and sewage disposal were approved on October 20, 1903; June 25, 1906; and July 6, 1911.

Location: Raybrook, Essex county, N. Y.

Site of institution: The institution is situated in the Adirondack mountains on the Plattsburgh and Lake Placid branch of the Delaware and Hudson railroad. It is distant about 4 miles from Saranac Lake and 6 miles from Lake Placid. The hospital is located upon ground having an elevation of something over 1,600 feet above sea level. The natural drainage is good.

Area of grounds: 516 acres.

Number of occupied buildings: 4 buildings, supplemented by a number of cottages of wood frame covered with canvas for summer use.

Capacity: 150 men, 150 women, 120 employees, total 420.

Present population: 151 men, 120 women, 110 employees, total 396.

Class of inmates: Incipient cases of pulmonary tuberculosis.

Water supply: The water supply of the institution is derived from a mountain stream. The intake is located about 2 miles from the hospital. Two reservoirs are located on a hill in the immediate rear of the hospital and have capacities of 1,000,000 and 25,000 gallons respectively. The institution does not own or control the watershed tributary to its water supply.

Milk supply: The milk supply of the hospital is obtained by purchase from a local dairy. It is used without pasteurization.

Sewerage and sewage disposal: The sanitary sewage of the institution is collected in a separate system of sewers in which it is conducted to the disposal plant, consisting of a grease trap, a settling tank, a sludge drying bed, a dosing chamber, a gate chamber, and a filter, 8 units of which are of sand and 2 of cinders. The small stream receiving the effluent has been cleaned and deepened to induce a more rapid flow.

Refuse disposal: Garbage is collected in galvanized iron barrels, and is removed under contract by a farmer who uses it for feeding to swine. All refuse of a nature not permitting such disposal is burned in an incinerator.

Recommendations

1. In regard to the water supply:

(a) That the fence around the intake be rebuilt as outlined in greater detail in the body of this report, and that the screen at the point of intake be cleaned and repaired.

(b) That suitable apparatus be installed by the institution at once, and that the water supply be sterilized with liquid chlorine at all times.

2. In regard to the milk supply:

(a) That the farmer supplying milk to the hospital be urged to make such changes as he outlined to our engineer, including a new milk room, at the earliest possible date.

(b) That milk be pasteurized at the hospital in accordance with approved methods.

3. In regard to the sewage disposal plant:

(a) That the manhole located on the sludge pipe line be built to a greater height in order that the pressure head necessary in the outlet pipe to carry the sludge away as fast as it enters may be maintained without danger of overflow at the manhole.

(b) That the sludge now piled on the sides of the sludge drying bed be removed.

(c) That as outlined in detail in the body of the report, not less than three pairs of sand filter beds be operated in rotation at any one time, thereby allowing two beds to stand idle for resting and cleaning.

(d) That the sand filter beds be maintained in operation during the entire year, and that they be ridged during the winter.

(e) That great care be exercised to obtain an even and level surface on the filter beds after cleaning.

4. That the care at present practiced in the handling of garbage and refuse be continued, and that the party contracting for the removal of garbage be compelled to remove same twice daily during the summer months as required by his contract.

ROCHESTER (State Hospital)

An investigation of the sanitary condition of the Rochester State Hospital at Rochester, Monroe county, was made by Mr. C. A. Howland, assistant engineer in this Department, on March 22 and 23, 1920. Previous investigations of the sanitary condition of the institution were made by this Department in 1915 (see page 973, Vol. II, of the 36th Annual Report) and in 1918 (see page 532, Vol. II, of the 39th Annual Report). Plans for water supply and sewage disposal were approved on January 13, 1909, and July 27, 1915.

Location: Rochester, Monroe county, N. Y.

Site of institution: The institution property is situated in the southern part of the city of Rochester. The elevation of the ground at the main building is about 560 feet above mean sea level, and about 60 feet above the level of the Genesee river which lies 1 mile to the west of the main building. A farm maintained in connection with the institution is located on the shore of Lake Ontario about 4 miles north of the village of Webster, Monroe county, and about 16 miles from the main hospital building.

Area of grounds: 207 acres in Rochester, and 62 acres at the Lake farm.

Number of occupied buildings: 20.

Capacity: 508 men, 752 women, 340 officers and employees, total 1,600.

Present population: 631 men, 939 women, 310 officers and employees, total 1,880.

Class of inmates: All classes of insane except the criminal insane.

Water supply: The main supply of the institution is obtained, as at the time of previous inspections, from two sources, namely, from the Hemlock Lake supply of the city of Rochester and from a drilled well located on the hospital grounds. The two supplies are cross connected, the city water being used to supplement the well supply particularly in the hot water services. Water is raised from the well by means of an air jet and is then pumped into a standpipe. About 200,000 gallons per day is pumped from the well and about 60,000 gallons per day is used from the city supply. The Garden cottage has been supplied with water from the well supply but has an auxiliary dug well. The water supply of the Lake farm is derived from a spring, the water of which is pumped into a steel pressure tank.

Milk supply: The milk supply for the hospital is obtained principally from local dairymen under a six months' contract. The grade of milk is not specified and pasteurization is not required. The milk used at the Lake farm is obtained from a small herd kept on the farm, which is said to have been tested and to be free from reactors.

Sewerage and sewage disposal: The sewage from the main hospital buildings is collected by a system of sewers which discharge into the east side trunk sewer of the city of Rochester. The sewage from several buildings which are too low to drain by gravity into the main sewer, flows to the pumping station from which it is pumped into the eastside trunk sewer. The sewage from Garden cottage is disposed of by means of a circular settling tank from which the sewage overflows into a system of subsurface tile radiating from the tank.

Refuse disposal: During the winter garbage is stored in wooden barrels without covers, and during the summer it is placed in galvanized iron garbage wagons in which it is taken each morning to the piggery where it is fed to swine . Noncombustible rubbish is taken to a city dump, and combustible rubbish is burned at the farm. Salable rags and papers are salvaged.

Recommendations

1. In view of the sources from which the milk for the institution is obtained, the potentially infective character of milk, and the necessity of preventing the spread of infection from this source, I would recommend that all milk supplies for the institution be effectively pasteurized.

2. That such alterations or repairs be made to the low level sewer system as may be necessary to prevent entrance of storm water or excessive infiltration of ground water into these sewers, and that if it is found after detailed investigation that such repairs or alterations will not reduce the maximum flow of sewage below the capacity of the pumps and force main, larger pumps and a larger force main be installed at the institution.

3. That the screens at the pumping plant be arranged so that they may be more easily cleaned, and that they be cleaned at sufficiently frequent intervals to prevent them from becoming clogged.

4. That the institution authorities consider the matter of providing a more satisfactory system of sewage disposal for the Lake farm.

5. That after appropriations have been obtained for any proposed alterations in existing water supplies, sewerage or sewage disposal systems, or for proposed new water supply, sewerage or sewage disposal construction, the State Architect be requested to prepare plans for such alterations or new work and submit such plans to this Department for approval as required by the Public Health Law.

SONYEA (Craig Colony for Epileptics)

An investigation of the sanitary condition of the Craig Colony for Epileptics at Sonyea, Livingston county, N. Y., was made by Mr. W. C. Emigh, assistant engineer in this Department, on June 24 and 25, 1920. Previous examinations of the sanitary condition of this institution were made by this Department in 1911 (see page 1050 of the 32nd Annual Report), in 1914 (see page 877, Vol. II, of the 36th Annual Report), and in 1918 (see page 533, Vol. II, of the 39th Annual Report). Special investigations of the water supply of the institution were made in 1910 (see page 584 of the 31st Annual Report), in 1915 (see page 638, Vol. II, of the 36th Annual Report), in 1916 (see page 599, Vol. II, of the 37th Annual Report), and in 1918 (see page 395, Vol. II, of the 39th Annual Report); and special investigations of the sewage disposal plant were made in 1907 (see page 820, Vol. II, of the 28th Annual Report) and in 1909 (see page 210, Vol. II, of the 30th Annual Report). Plans for water supply were approved on January 25, 1913; August 3, 1916; May 29, 1917; July 5, 1917; July 16 and July 27, 1920; and plans for sewerage and sewage disposal were approved on January 20, 1904; August 16, 1920; and July 16, 1914.

Location: Sonyea, Groveland township, Livingston county.

Site of institution: The institution is situated in the valley of the Canaseraga creek, about 4 miles southeast of the village of Mount Morris. Keshequa creek which is a tributary of Canaseraga creek, flows through the institution grounds, dividing them into an eastern and western portion. The elevation of the ground varies from about 580 feet above mean sea level in the northern part to 820 feet in the southern part.

Area of grounds: 1,895 acres.

Number of occupied buildings: 99.

Capacity: Inmates, men 825, women 675, total 1,500; employees 269; total population, 1,769.

Present population: Inmates, 698 men, 798 women, total 1,406; employees 249; total population, 1,655.

Class of inmates: Epileptics of all ages, excepting infants in arms, who are indigent and residents of New York state.

Water supply: The water supply of the institution is derived entirely from Keshequa creek, except at times of high turbidity in the water of that stream. There are two separate systems of piping throughout the entire colony. One system is used for creek water which has been treated with liquid chlorine but has not been filtered, whereas the other is used for chlorinated, softened, and filtered water. Nearly all of the household water taps are connected with the filtered water system and it is expected that all will soon be so connected. The power house, pumping plant, softening plant, and filtration plants are centrally located on the west bank of Keshequa creek. A concrete dam with a double crest diverts water to the suction well from which it is pumped into the institution mains, the surplus accumulating in the outer compartment of a double standpipe located at a distance of about three-fourths of a mile from the power house. All water pumped from the creek into the raw water mains is chlorinated. About 12 per cent of the total water consumed is treated in a softening and filtration plant located on the west bank of the creek just across a highway from the power and pumping station. The softening plant is of the type manufactured by the Booth Water Softening Company, and has a rated capacity of 500,000 gallons per day. Water treated in this plant flows to a coagulation basin from which it flows by gravity to the filters. These filters are of the gravity mechanical type and were designed for a consumption of 500,000 gallons per day. The filtered water flows to a circular clear water basin from which it is pumped by pumps located in the power house to the inner compartment of the standpipe. An additional supply is occasionally derived from a well or spring located on flat land about 800 feet from the sewage disposal plant. This source of supply is subject to pollution, and as no provision has been made for chlorinating the water therefrom its use is attended with danger. Plans have recently been approved by this Department for the development as a reservoir of a natural depression situated on the institution property.

Milk supply: All the milk used at the institution is obtained from the institution herd of 65 Jersey milch cows. The herd was tuberculin tested in the fall of 1919. Milking is done by inmates and the milk is used without pasteurization.

Sewerage and sewage disposal: The sanitary sewage and storm water of the institution are collected by separate systems of sewers. The sanitary sewage is conducted to a sewage disposal plant consisting of a screen chamber, a detritus tank, a settling tank, a dosing tank, and a 12-unit sand filter. Two units of the sand filter are used for sludge drying. The 6 easterly units of the sand filter are constructed of ungraded gravel, sand, and a considerable portion of loam. The 6 westerly units are constructed of sand overlying graded gravel.

Refuse disposal: The garbage is stored at the various kitchens in galvanized iron barrels and cans from which it is collected daily and transported to the piggery where it is fed to swine. Rubbish is placed on a dump, and waste paper is baled and sold.

Recommendations

1. As regards the water supply:

(a) That the construction of the raw water storage reservoir and pipe line as shown on plans recently approved by this Department be completed and that the reservoir be placed in use at the earliest possible date.

(b) That after the completion of the storage reservoir no water be pumped directly from the creek into the distribution mains except in case of absolute necessity.

(c) That after the completion of this storage reservoir the spring supply be entirely abandoned.

(d) That no water be pumped into either distribution system which has not been filtered except in case of extreme fire emergency.

(e) That if it becomes necessary to pump raw water into either system in case of fire, such water be treated with at least .5 parts per million of chlorine.

(f) That the entire capacity of the standpipe be used as storage for filtered water.

(g) That the automatic control and loss of head gauges be placed in proper operating condition.

(h) That the sludge drying bed accessory to the coagulation basin be increased in size sufficient properly to care for the sludge resulting from the softening of the entire quantity of water used.

2. In regard to the milk supply:

(a) That the practice of employing inmates for the work of milking and handling of milk be discontinued, and that competent employees be used or milking machines be adopted for milking.

(b) That the milk used at the institution be pasteurized by approved methods.

3. In regard to sewerage and sewage disposal:

(a) That means be found to reduce the quantity of ground water entering the system, or that a pipe line be installed from the detritus tank to the settling tank of capacity sufficient to care for the maximum flow of sewage and infiltered ground water.

(b) That the siphons be thoroughly cleaned and every effort be made to maintain them in such condition that their operation will be automatic and positive at all times.

(c) That water under pressure be piped to the sewage disposal plant to provide for cleaning and flushing of tanks and drains.

(d) That the repairs to the walls of the settling tanks contemplated by the institution authorities be effected at an early date.

(e) That plans be prepared and submitted to this Department showing a sludge drying bed of sufficient capacity to care for the sludge of both the settling and detritus tanks, and that upon approval of the plans the bed be constructed.

(f) That the gravel in the filter units of the easterly row be removed and replaced by proper sand overlying graded gravel.

(g) That until the construction of a sludge drying bed and the release of two units now used for that purpose for filtering, a minimum of seven beds be maintained in operation, and that after this construction nine beds be maintained in operation at all times.

4. In regard to refuse disposal:

(a) That those in authority at the various cottages be instructed to exercise care to keep the garbage barrels and cans covered at all times.

(b) That a metal body or a metal lined body be provided for the wagon used for collecting the garbage and refuse and that this body be washed daily.

THIELLS (Letchworth Village)

An investigation of the sanitary conditions of Letchworth Village at Thiells, Rockland county, was made by Mr. C. A. Howland, assistant engineer in this Department, on January 28 and 29, 1920. Previous investigations of the sanitary conditions of the institution were made by this Department in 1915 (see page 890, Vol. II, of the 36th Annual Report), and in 1917 (see page 640, Vol. II, of the 38th Annual Report). A special investigation of the supply was made in 1912 (see page 600 of the 33rd Annual Report). Plans for water supply, sewerage and sewage disposal were approved on July 27, 1910, and on September 29, 1919.

Location: Adjoining the village of Thiells, in the towns of Haverstraw and Stony Point, Rockland county.

Site of institution: The buildings of the institution are situated principally in the valley of Minisceango creek and its north branch, while the

property of the institution extends into the mountainous country bordering these streams. The property rises from an elevation of about 320 feet above mean sea level at Minisceango creek, to an elevation of about 1,140 feet on the summit of the mountain south of the water supply reservoir. In general, the property appears to be well drained, and is being graded in the vicinity of the buildings as rapidly as the available labor permits.

Area of grounds: 2,100 acres.

Number of occupied buildings: 19 (11 buildings ready to be occupied in the spring of 1920; contract awarded for the construction of 10 other buildings).

Capacity: 400 boys, 210 girls, 134 employees, total 744.

Present population: 401 boys, 210 girls, 109 employees, total 720.

Class of inmates: Epileptic and feeble-minded persons.

Water supply: The principal water supply is derived from a reservoir formed by an earth dam with a concrete core wall constructed in the western end of the institution property at the junction of two tributaries of the north branch of the Minisceango creek. There is a total watershed area above the dam of 2.9 square miles, and a storage of 21 million gallons is provided. The intakes are so arranged that water may be drawn either from the bottom of the reservoir or from an intake at an elevation 12 feet below the overflow weir crest. The water consumption is between 90,000 and 100,000 gallons per day, and the pressures at the institution are from 100 to 150 pounds per square inch. In order to protect the plumbing fixtures, it has been found necessary to install pressure reducing valves in the buildings. Trouble has been experienced at the institution with extensive pitting in the hot water system. Because of the discoloration of the water and of the material which accumulated in the range boilers, the hot water pipes on the new buildings are lined with lead. Wells are used at a number of buildings, particularly at the separate farms.

Milk supply: The entire milk supply of the institution is obtained from the institution herd of 45 cows. They are tested for tuberculosis each year and the tubercular cows are removed from the herd and disposed of. The milking is done by means of machines and the cows are stripped by hand. The milk is used without pasteurization.

Sewerage and sewage disposal: The sanitary sewage of the institution is collected in a system of separate sewers ranging from 8 inches to 16 inches in diameter. It is conveyed to a sewage disposal plant located in the southeastern part of the institution property near Minisceango creek, consisting of a diverting chamber, preliminary settling tanks, secondary settling tanks of the vertical flow type, dosing chamber, sprinkling filters, final settling tanks, a sludge digestion tank, and a sludge bed. The effluent of the final settling basins is discharged without further treatment into Minisceango creek, and at the time of the inspection no apparent conditions of nuisance were created thereby.

Refuse disposal: The garbage of the institution is stored in covered galvanized iron cans in the kitchens in winter and in buildings provided outside of the kitchens in summer. It is removed to the piggery daily where it is used for feeding. Combustible rubbish is burned on a dump in a perforated metal cylinder provided for that purpose. Ashes and noncombustible rubbish are used to fill a low area near the Secor group.

Recommendations

1. That in order to safeguard the water supply against the present possibilities of contamination, a filtration plant or a chlorination plant, or both, be installed.

2. That in order to lessen the corrosion of piping systems, particularly the hot water system, consideration be given to the following alternatives:

   (a) Aeration of the supply and decarbonization by application of lime, taking the water from the surface strata of the reservoir.

   (b) Reducing the temperature of the water in the hot water system to 150°F. or less by suitably installed regulating devices.

(c) Substituting cement lined, porcelain lined, or glass lined hot water heaters instead of the present iron tanks, the pressure in these tanks being regulated by supplying them from auxiliary tanks in the tops of the buildings.

(d) Use of brass pipes and tanks instead of iron pipes in the hot water system.

3. That in order to improve the physical quality of the water, lessen accumulation of silt and organic matter in the bottom of the reservoir, and free the reservoirs from stagnant and probably highly carbonated water in the bottom strata of the reservoir, the reservoir be drained or flushed out through the lower gate during periods of considerable runoff from the watershed when surplus water would otherwise be wasted through or over the waste weir.

4. In regard to the sewage disposal plant:

(a) That the piping of the smaller primary settling tanks be rearranged so that they will discharge into the pipe line from the diverting chambers to the large settling tanks, and that the use of these small settling tanks be discontinued until this is done.

(b) That the riser pipe to the valve on the sludge pipe of the first primary settling tank be repaired.

(c) That when the group of buildings now ready for occupancy is placed in service, both large settling tanks of the sewage disposal plant be used.

(d) That only the smaller of the two dosing tanks be used at the present time, but that the larger dosing tank be used alone when the new group is occupied.

(e) That the sprinkling filters be filled with filter material to the collars of the nozzles, the broken underdrains repaired, and the entire filter be placed in service.

(f) That the final settling tanks be cleaned out at sufficiently frequent intervals to prevent any considerable decomposition of organic matter in the tanks.

(g) That the sludge, after proper digestion in the sludge digestion tank, be drawn off into trenches as provided by the plans approved by this Department.

(h) That a chlorination plant for the treatment of the effluent of the sewage disposal plant, in accordance with the plans approved by this Department, be installed as soon as possible.

5. That the privy at the cow barn be discontinued and that a flush closet be provided at the cow barn, the sewage from which should be discharged into a cesspool or adequate subsurface irrigation system if no sewer of the institution system is available to receive it.

6. That in view of the conditions surrounding the production of milk in the institution, the potentially infective character of milk, and the necessity of preventing the spread of disease by this means, arrangements be made effectively to pasteurize the milk used at the institution.

WEST HAVERSTRAW (State Hospital for the Care of Crippled and Deformed Children)

An investigation of the sanitary condition of the New York State Hospital for the Care of Crippled and Deformed Children at West Haverstraw, Rockland county, was made by Mr. C. A. Howland, assistant engineer in this Department, on January 27, 1920. Previous investigations of the sanitary condition of the institution were made by this Department in 1910 (see page 688 of the 31st Annual Report), in 1914 (see page 485, Vol. II, of the 35th Annual Report), and in 1917 (see page 640, Vol. II, of the 38th Annual Report). Plans for water supply were approved on December 5, 1916, and on September 16, 1919; and plans for sewers were approved on November 15, 1905.

Location: Village of West Haverstraw and town of Haverstraw, Rockland county.

Site of institution: The institution is situated about 1 mile west of the Hudson river and about 1½ miles northwest of the West Haverstraw station on the West Shore railroad. The engineer was informed that a low area which previously existed on the institution property has been filled in with rock and ashes and covered with earth, eliminating the stagnation of water in this area. The drainage of the institution proper is said to be good. Although mosquitoes are numerous at times, they are believed not to be unusually so for this region.

Area of grounds: 93.5 acres.

Number of occupied buildings: 10.

Capacity: 76 boys, 76 girls, 82 employees, total 234.

Present population: 94 boys, 79 girls, 63 employees, total 236.

Class of inmates: Indigent children who may have resided in the State of New York for a period of not less than one year, who are crippled or deformed or are suffering from disease from which they are likely to become crippled or deformed.

Water supply: The water supply for the institution is obtained from the mains of the Haverstraw Water Supply Company of Haverstraw. A water supply to be obtained at the institution from a deep well, for which plans were approved by this Department, has not been completed. At a farm house located about one mile from the main institution buildings a well is used to supply drinking water although the village water is piped into the building. This well is subject to contamination by the means used to obtain water from it and is also exposed to surface wash. Both the analyses of samples of the water of the main supply taken at the time of the investigation and analyses made in the past show that this water supply is subject to active contamination, and cannot therefore be considered as satisfactory from a sanitary standpoint.

Milk supply: The milk supply of the institution is obtained by purchase from two dairies located at Mount Ivy, in the town of Haverstraw. It is obtained by contracts which specify that the milk shall be Grade A raw. No provision is made for pasteurization either at the dairies or at the institution.

Sewerage and sewage disposal: The sanitary sewage and storm water of the institution is collected by a system of combined sewers and discharged into the Hudson river without treatment. The sewage from the farm house is discharged into a cesspool.

Refuse disposal: The garbage of the institution is stored at the kitchen in galvanized iron cans from which it is removed after each meal and fed to the chickens or placed on a manure pile. Rubbish is placed on a dump where the combustible portions are burned.

Recommendations

1. That the well water supply of the institution, for which plans were approved by this Department, be completed and placed in service as soon as possible.

2. That the well at the farm house be abandoned and a new supply of satisfactory sanitary quality be provided, or that the well be properly protected against contamination and the water be drawn from it in such a manner as to prevent the contamination of the well.

3. That the dump for the disposal of rubbish be removed to a point as far as practicable from the institution buildings, that no garbage be disposed of on this dump, no rubbish be burned near the buildings, and that the garbage cans be covered at all times.

4. That a pasteurizer for the pasteurization of all the milk used at the institution be provided.

5. That the institution authorities take steps to provide for at least a partial treatment of the sewage of the institution before it is discharged into the Hudson river, and that plans for such treatment works

be prepared by the State Architect and submitted to this Department for approval in accordance with the provisions of section 14 of the Public Health Law.

WILLARD (State Hospital)

An investigation of the sanitary condition of the Willard State Hospital at Willard, Seneca county, N. Y., was made by Mr. C. A. Howland, assistant engineer in this Department, on December 30 and 31, 1919. Previous examinations of the sanitary condition of this institution were made by this Department in 1914 (see page 486, Vol. II, of the 35th Annual Report), and in 1918 (see page 534, Vol. II, of the 39th Annual Report). A special investigation relating to the prevalence of typhoid at the institution was made in 1910 (see page 613, Vol. II, of the 31st Annual Report). Specifications for chlorinators to treat the water supply were approved in January, 1919; and plans for sewerage and sewage disposal were approved on June 13, 1912, on condition that the effluent be sterilized before its discharge into Seneca lake.

Location: The Willard State Hospital is situated partly in the town of Romulus and partly in the town of Ovid, Seneca county, on the east shore of Seneca lake, about half way between Watkins and Geneva.

Site of institution: The grounds of the institution rise from an elevation of 444 feet above mean sea level at the lake, to an elevation of about 740 feet at a distance of 1½ miles east of the lake. The ground slopes are apparently sufficient to provide adequate drainage for the institution property.

Area of grounds: 1,204 acres.

Number of occupied buildings: 80.

Capacity: 1,016 men, 1,098 women, 518 employees, total 2,632.

Present population: 1,182 men, 1,240 women, 436 employees, total 2,858.

Class of inmates: All classes of insane except the criminal insane.

Water supply: The principal water supply of the institution is pumped from Seneca lake. The water is treated with liquid chlorine by apparatus located in the pump house. The water is pumped into a storage reservoir with a capacity equivalent to from 4 to 10 days' storage. From this reservoir water flows by gravity to a low level system. Water is also pumped from the reservoir into a high level system, storage for which is provided by an elevated steel tank. In addition to the main water supply taken from Seneca lake, several springs are in use about the institution.

Milk supply: The entire milk supply for the institution is obtained from the institution herd of 139 cows. These cows have not been recently tested for tuberculosis. Inmates are employed to do the milking. The milk is used without pasteurization.

Sewerage and sewage disposal: The sanitary sewage of the main buildings is collected by a system of separate sewers and conducted to the sewage disposal plant. The disposal plant consists of a screen chamber, a settling tank, a dosing chamber, sprinkling filters, a hypochlorite dosing apparatus, a final settling tank, and sludge bed. The effluent of the plant is discharged into Seneca lake about one mile south of the waterworks intake. Sewage from the superintendent's house and several other buildings flows to the pumping station, from which it is pumped into the main sewers. Three cottages, owing to their location in remote parts of the grounds, are not connected with the general sewerage system. From one cottage the sewage flows directly into the lake, and from the other two it is settled in tanks.

Refuse disposal: The garbage from the cottages is placed in galvanized iron cans from which it is collected and transported in metal-bodied cars mounted on standard gauge railway tracks to the piggery, where it is fed to swine. Combustible rubbish is burned in an old boiler. Noncombustible rubbish is used to fill a small depression. Rags and papers are salvaged.

Recommendations

1. That the springs from which the water supplies are derived at Hillside, Maples, and Buttonwood be properly protected against pollution, or that the springs be abandoned and water supplies of safe sanitary quality and adequate quantity be provided for these places.

2. That the institution authorities consider the matter of installing a suitable filter plant to treat all the water taken from the lake.

3. That the chlorinating device at the sewage disposal plant be placed in proper operating condition, and the chloride of lime used for treating the effluent from the sprinkling filters be applied at a uniform rate of not less than 250 pounds per million gallons of sewage treated.

4. That properly designed and constructed sewage disposal plants be installed to dispose of the sewage from Hillside, Vinelands, and Buttonwood, plans for which should be prepared by the State Architect and submitted to this Department for approval before such plants are constructed as provided by section 14 of the Public Health Law.

5. That the use of privies at the institution be discontinued wherever possible, and flush closets, the sewage from which should be discharged into the sanitary sewer system of the institution or into adequate sewage disposal plants installed to dispose of the sewage from them, be installed if necessary at some convenient place.

6. That wherever it is necessary to maintain privies the contents be made inaccessible to flies, and the privies be maintained in a sanitary condition.

INVESTIGATION OF SEWAGE DISPOSAL PLANTS

The work of investigating municipal, institutional, and private sewage disposal plants has been confined almost entirely during 1920 to plants concerning which complaints have been made, or where requests for inspections have been made by municipal or institutional authorities or local boards of health, or to plants which were involved in questions of public water supply.

In the case of each investigation a complete and accurate description of the construction and operation of the plants is obtained in the field, and after a study of the results of the investigation a report is prepared containing recommendations for any improvements necessary in the construction and operation of the plant. A copy of the report is transmitted to the municipal or institutional authorities, urging them to carry out the recommendations of the report.

The reports of the investigations made by this Department in the more important cases of sewage disposal which have come before it during 1920 are given below, and a list is appended of all other cases.

ALTAMONT

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on an investigation of the operating condition of the sewage disposal plant at Altamont, made by Mr. Earl Devendorf, assistant engineer in this Department, on May 7, 1920, in company with Mr. W. W. Chadsey, consulting engineer for the village.

Altamont is an incorporated village in the northwestern part of Albany county on the Delaware and Hudson railroad, 18 miles west of Albany. Its population, according to the census of 1915, is 805.

The village is provided with a public water supply owned by the village and derived from a small upland creek tributary to the Bozen kill. The intake and storage reservoir are located about 2½ miles west of the village.

The sewage of the village is collected in a separate system of sewers, and flows by gravity to a sewage disposal plant located near the Bozen kill about three-quarters of a mile northeast of the village, into which the sewage effluent from the disposal plant is discharged. The Bozen kill empties into the Normans kill above the reservoir used by the city of Watervliet as a source of public water supply. The point of discharge of the disposal plant of Altamont is about 2½ miles above this reservoir, the water from which reservoir is filtered through gravity mechanical filters and chlorinated before it is delivered to the mains. The Bozen kill has a drainage area above the disposal works of about 29.7 square miles. Plans for a system of sewers for the village of Altamont were first approved by this Department on August 19, 1907. Amended plans for sewerage and sewage disposal were later submitted to this Department and approved under date of October 5, 1917.

The disposal plant consists of an Imhoff tank, dosing chamber, sprinkling filters, and final chlorination plant. The sewage disposal works were designed to serve a population of 400 people, and arranged in units so that

extensions could be made as additional houses are connected to the sewers. The estimated flow used in designing the plant was 100 gallons per capita per day.

On this basis the Imhoff tank is of such size as to give an average detention period of about 2½ hours in the sedimentation compartment, and to provide a sludge storage capacity in the digestion chamber of 1.25 cubic feet per capita, or .007 cubic foot per capita per day for 6 hours' period. The Imhoff tank has a gas vent area equivalent to .03 square foot per capita, and a total liquid capacity of 4.4 cubic feet per capita. The velocity through the tank for the maximum rate of flow is .0028 foot per second.

At the time of the inspection the flow of sewage was estimated by timing the operating cycle of the siphon which has a capacity of 600 gallons. The siphon filled in 4¼ minutes and discharged in 3¾ minutes. At this rate the flow of sewage amounted to from 175,000 to 190,000 gallons per day, or over 3½ times the estimated rate of flow. This is due to the large amount of ground water finding its way into the sewer system. From the data and information obtained by our engineer at the time of the inspection, it would appear that this ground water does not find its way into the sewer system by infiltration into the sewers themselves, but enters mainly through drains located in the cellars of inhabitants of the village. The engineer was informed that a survey is shortly to be made covering the entire village with a view to removing this source of ground water flow. The sewage as it entered the plant at the time of the inspection was very dilute, and measurements made with a turbidity rod showed a turbidity of only 15, while the tank effluent had a turbidity of 10. These results show the very dilute character of the sewage being treated at the time of the inspection.

Until this large amount of ground water entering the sewer system is removed, the present plant, especially the Imhoff tank, is overtaxed and cannot satisfactorily treat the sewage. At the time of the inspection the discharge end of the sedimentation compartment was filled with solids to a point within 1⅓ feet of the top of the water surface. When a stick was used to test the other end, solid material was also found to have accumulated over the slot. The operator in charge should daily use a squeegee to force any solids which may accumulate through the slot into the digestion chamber below.

At the time of the inspection a large amount of solid material was found to have passed from the Imhoff tank to the bottom of the siphon, which when the engineer arrived was found to be in continuous operation and did not break. This was caused by the large flow being treated at the time of the inspection, which flow exceeded the capacity of the distribution system and the siphon could be made to break in operation only by removing 2 of the nozzles on the filter bed and allowing a 2-inch stream to flow from these 2 nozzles during operation. In this connection the operator informed our engineer that during December the time of filling the dosing chamber varied from 6½ to 8 minutes, during January from 7½ to 15 minutes, during February from 7 to 10 minutes, and that commencing March 5, when it rained all night, the siphon flowed continuously without breaking due to the greatly increased flow which has during the past spring been much in excess of the usual flow.

The sprinkling filter has an area of 1,650 square feet and an average depth of 4.75 feet. The sewage is applied to the filters through 12 nozzles, of which 3 are half nozzles of the Worcester type, spaced on 13 feet centers. The filter was designed to operate at a rate of 1,000,000 gallons per acre per day, or 220,000 gallons per day per foot of depth. The nozzles operate with a maximum head of 6.5 feet and a minimum head of 1.5 feet. The underdrain system of the sprinkling filter consists of 6-inch split tile which drain to a trough on one side of the concrete floor of the filter, from which the effluent flows through a 12-inch tile pipe to the chlorinating tank.

The surface of the sprinkling filters gave evidence of being heavily overdosed, there being some pooling around the nozzles. Several of the nozzles were found to be partially clogged by solid material which had passed over from the sedimentation tank. The operator should be instructed to keep the nozzles free from all obstruction, and in cleaning the nozzles to remove only the cone and to replace the same in as short a time as possible and thus

prevent any overdosing of the bed. In places where pooling has already started, it would be advisable to rake over the surface of the beds with a stone fork. The pooling of the surface of the bed appears to be caused partly by the attendant removing the base as well as the cone of the nozzles for the purpose of cleaning. While it was necessary at the time of the inspection to remove 2 of the nozzles in order to allow the siphon to break properly, as pointed out above, this practice should be discontinued, as it not only caused a heavy overdosing of that portion of the sprinkling filter beds surrounding the nozzles, but it might also loosen any organic growth which might adhere to the inner surface of the distribution system by the increased velocity through the pipes, with the result that this matter would be discharged onto the surface of the beds near the nozzles and cause clogging and pooling of the filters. In order to obviate the need for removing any of the nozzles from the sprinkling filters, the village authorities should take immediate steps to prevent ground water from reaching the sewer system, as described above. In addition, it might be well to replace the present nozzles with nozzles having larger orifices and thus increase the capacity of the distribution system. These directions, if properly carried out, will it is believed put the filters in a better operating condition for doing the work for which they were designed, namely, oxidizing the tank effluent. In addition one corner of the filter bed was filled with earth which had been washed in by the surface water from the banks above. The stone in this portion of the filter bed should be removed, washed, and replaced.

Sludge is drawn from the Imhoff tank by gravity onto the sludge bed which has an area of 225 square feet, corresponding to an area of .56 square foot per person served. At the time of the inspection no sludge had been drawn from the Imhoff tanks, and our engineer was informed that no measurements had been taken to determine the amount of sludge in the tank. In this connection it should be noted that it is much better to withdraw sludge in relatively small doses and at frequent intervals during the summen than in large doses at long intervals. A concrete apron had just been constructed at the outlet end of the sludge pipe on the surface of the bed. It is doubtful, however, if this apron is of sufficient size to prevent scouring or washing of the surface of the bed. Care should be taken to observe this point, and if conditions warrant a larger apron should be provided in order that sludge may not directly enter under portions of the bed and cause any clogging.

At the time of the inspection the chlorination plant was in operation and the manometer on the chlorinating apparatus indicated that chlorine was being applied at a rate of 1.6 pounds per 24 hours. This corresponds to a rate of application of 1.0 p.p.m. This rate is inadequate, and does not meet the requirements stipulated in the permit issued by this Department for the discharge of the sewage effluent into the stream at this point. The attendant at the plant informed our engineer that only about 1½ tanks of chlorine had been changed since the plant had been started in operation. At the time of the inspection our engineer increased the rate of application of chlorine to 10 p.p.m. as required by the permit, and instructed the attendant that the rate should never be less than this amount. When the excessive ground water is removed from the sewer flow, it is very important that the chlorine be applied at all times at a rate of not less than 10 p.p.m., in order that the water supply of Watervliet, which is taken a short distance below, may be safeguarded. While passing the plant on May 15 our engineer inspected the chlorine tank and found no gas at all being applied to the filter effluent. This, the designing engineer later stated, was due to the fact that no chlorine was at hand. In this connection care should also be taken to keep an extra cylinder of chlorine on hand at all times.

At the time of the first inspection samples of the raw sewage, Imhoff tank effluent, sprinkling filter effluent, and the final chlorinated effluent were collected and sent to the Division of Laboratories and Research for analyses, the results of which are given in the appended table.

The results of these analyses indicate that the chlorination plant was being operated in such a manner as effectively to sterilize the final effluent. The results of the stability test as measured by the methyelene blue standard

show the Imhoff tank effluent and the sprinkling filter effluent to have a relative stability of 94 and 96 per cent respectively.

In view of the above facts the following conclusions may be drawn:

1. That as a result of the large amount of ground water being admitted to the sewer system at the time of the inspection, the sewage being treated at the plant was of a very dilute character.

2. That due to the excessive amount of ground water entering the sewer system, the present plant is inadequate and cannot satisfactorily treat the amount of sewage flowing at the time of the inspection.

3. That at the time of the inspection there were large accumulations of solids in the sedimentation chamber, giving rise to septization in the presence of the sewage flowing through the settling compartment.

I therefore recommend:

1. That the village authorities immediately make a detailed survey of the system with a view of reducing the amount of ground water entering the sewer system, and if it is found that the amount of ground water entering the system cannot be materially reduced, an additional unit be added to the present plant in order that the sewage may receive satisfactory treatment.

2. That the operator make monthly determinations of the depth of sludge at the bottom of the tank in the digestion chamber in order that a better record may be kept of the amount of sludge in the tank and the time for removing the sludge may thus be determined.

3. That the operator daily squeegee the sides and bottom of the sedimentation chamber in order to dislodge any solid matter which may have accumulated there due to roughness or insufficient slope and push it through the slot and thus prevent septization taking place in the sedimentation compartment.

4. That in cleaning the nozzles the practice of removing the whole nozzle be discontinued, and that the cone only be removed in order to lessen the liability of pooling on the surface of the filter bed.

5. That the stone in that portion of the filter bed which is filled with earth be removed, washed, and replaced.

6. That an extra cylinder of chlorine be constantly kept on hand and chlorine be applied to the sprinkling filter effluent at all times at a rate of not less than 10 p.p.m.

7. That a record be kept of the time of changing the cylinders of chlorine and the daily loss of waste in order that the amount of chlorine applied may be known.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *August* 10, 1920

Copies of this report were sent on August 12, 1920, to the village authorities and local board of health, to the sanitary supervisor, and to Mr. W. W. Chadsey, consulting engineer.

Altamont

Source	Date	Bacteria per c. c.	B. Coli 1	B. Coli 1/10	B. Coli 1/100	B. Coli 1/1,000	B. Coli 1/10,000
Raw sewage — Inlet to Imhoff tank	5/7/20	42,500	......	......	2+0—	2+0—	1+1—
Imhoff tank effluent	5/7/20	59,000	......	......	2+0—	2+0—	1+1—
Filter effluent	5/7/20	12,500	......	2+0—	2+0—	2+0—	......
Chlorinated final effluent	5/7/20	10	0+3—	0+3—	0+3—	......	......
Chlorinated final effluent	5/7/20	10	0+3—	0+3—	0+3—	......	......

CORTLANDT (Town) Valeria Home

HERMANN M. BIGGS, M. D., *State Commissioner of Health:*

I beg to submit the following report on an inspection of the sewage disposal plant of the Valeria Home, Westchester county, N. Y., made on September 13, 1920, by Mr. W. C. Emigh, assistant engineer in this Department.

Valeria Home is an institution of a semi-philanthropic character, designed to provide a rest and health resort for business women at a cost lower than that generally prevailing at such resorts. It comprises about 1,000 acres, in the town of Cortlandt, and is located about 4 miles southeast of Peekskill.

The water supply of the institution is derived from driven wells located in the northeastern section of the institution grounds, about 2,800 feet from the sewage disposal plant.

Plans for sewerage and sewage disposal for the home were approved by this Department on July 15, 1918. The recent inspection was made at the time of an investigation of the feasibility, from a sanitary standpoint, of erecting a swimming pool for the use of the guests of the home.

The essential feature of the sewage disposal plant are primary settling tanks, a sprinkling filter, a secondary settling tank, and a sand filter. The sewage is collected in a system of tile sewers. It is conducted to the disposal plant where it first enters a circular upward flow settling tank 9 feet in diameter and having a depth below the flow line of 9 feet 3 inches. Sewage is introduced at a point about 1 foot above the bottom of the tank with a downward velocity. It flows upward and radially and is collected in troughs on the inside periphery of the tank. The effluent from this tank passes to a second settling tank of the two-story horizontal flow Imhoff type. Each of these tanks is provided with valves and piping for blowing off the accumulated sludge. A sludge bed is provided which is covered partly by a wooden roof and partly by glass.

The effluent of the settling tanks passes to a dosing chamber fitted with a 6-inch Miller siphon. From this chamber sewage is discharged through nozzles on to the surface of the sprinkling filter. This filter is provided with a superstructure and is thus completely inclosed. The effluent of the sprinkling filter passes to a secondary settling tank of the Imhoff type. The effluent of this tank is discharged into a closing chamber in which is a 4-inch Miller siphon. From this dosing chamber the sewage is discharged onto the surface of 2 sand filters, 23½ feet square each.

At the time of the investigation it was found that the disposal plant was not operating properly and that a leakage of sewage was taking place. The first manhole on the sewer line above the settling tanks is located at a distance of about 140 feet from the first tank. The sewage flowing through this manhole at the time was estimated to be about the quantity to be expected as a contribution from 30 people, the approximate number at the institution at the time. Owing to the nature of the construction of the first settling tank it was impracticable to observe the quantity of the sewage entering it. At the point of discharge of the effluent from the first into the second tank, the quantity of sewage appeared to be only a fraction of that observed in the manhole. A heavy scum was found on the first tank. The first siphon dosing chamber was filled to about the level thought to be the point of priming of the siphon, but the siphon was not in operation. It was stated that it had not been operated during the current year.

A small amount of sewage was flowing from 1 or 2 of the 4 nozzles in the sprinkling filter, but owing to the failure of the siphon as mentioned no periodic application of sewage occurred. It appeared that the small amount of sewage reaching this filter was lost at some point of leakage, as the siphon chamber intended to collect and discharge the effluent of the secondary Imhoff tank on to the sand filter was dry.

It thus appears that a leakage of sewage takes place between the last manhole on the sewer line and the point of entrance of sewage into the second settling tank, and that a further leakage occurs in the sprinkling filter or the secondary settling tank. As the primary settling tanks at the lower end of the sewer line are located on the brow of a steep hill, search was made

for a point below the plant at which sewage which had leaked from the system reached the surface, but no such point was found. It further appears that for some cause, presumably a stoppage of the blow-off trap, the first siphon was not in operating condition. Owing to the failure of the sewage to reach the sprinkling and sand filters, it was impossible to determine the operating condition of these filters. At the time of the inspection the sludge blow-off valve of the primary Imhoff tank was opened and the accumulated sludge discharged onto the sludge drying bed, but it was found to be impossible to open the sludge blow-off valve of the first settling tank with the apparatus available.

In view of the conditions found to exist at the time of the recent inspection as described in the body of this report, it appears that the sewerage system and the sewage disposal plant at Valeria Home, in the town of Cortlandt, is not functioning properly.

I would therefore recommend:

1. That the institution authorities employ a competent sanitary engineer to make a careful inspection to determine the point or points of leakage of sewage from the system, and that such leakage be remedied.
2. That means be found to open the sludge blow-off valve of the first settling tank and that the accumulated sludge therefrom be discharged onto the sludge drying bed.
3. That the contents of the first dosing chamber be removed and the automatic dosing siphon be cleaned and placed in condition to operate properly.
4. That careful attention be given to the operation of the sewage disposal plant and that the units of the plant be maintained in efficient operating condition.

Respectfully submitted
THEODORE HORTON
Chief Engineer

ALBANY, N. Y., *October* 27, 1920

Copies of this report were sent on October 28, 1920, to the local board of health, to the sanitary supervisor, and to the director of Valeria Home.

NEWARK

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on an investigation of the sewage disposal plant of the village of Newark, Wayne county, made by Mr. Earl Devendorf, assistant engineer in this Department, on November 18, 1919.

The recent inspection of the sewage disposal plant of the village was made as the result of a request received by this Department from Dr. Augustus A. Young, local health officer, asking that this Department inspect the disposal plant, report as to its operating conditions and efficiency, and make any suggestions for bettering the operating conditions. The engineer was accompanied on the inspection by Mr. Stanley Scarth, superintendent of water and sewers.

Previous investigations of the operating condition of the sewage disposal plant of the village were made by a representative of this Department in 1914 and 1916. Reports setting forth the results of these investigations were prepared and transmitted to the village authorities and printed in the annual reports of the State Department of Health for those years. These reports give a detailed description of the construction and operation of the disposal works and this data will not therefore be reviewed at this time.

The 1914 report recommended:

1. That a sterilization plant be installed to sterilize the effluent from the disposal works, inasmuch as the village of Lyons was using the stream into which the effluent was being discharged.
2. That the pumping station be so operated as to prevent the bypassing of the sprinkling filters and of the final settling tank at all times.

3. That the uneven distribution of the settling tank effluent over the sprinkling filters be corrected.

4. That a more careful operation of the final settling tank be provided to remove the sludge more effectively.

The 1916 report recommended:

1. That the village prohibit the discharge of industrial wastes into the sewer system in sufficient quantity and of a nature such as to prevent the proper operation of the sewage disposal works.

2. That the pumping station be so operated as to provide for the treatment of the sewage at all times.

3. That provisions be made for operating the pumping station or providing changes in the dosing apparatus in order to obtain a uniform distribution of sewage applied to the trickling filters.

4. That the final settling tank be kept clean in order that no sludge shall be discharged into the creek from the disposal works.

Newark is an incorporated village located about 30 miles east of Rochester, on the New York Central, West Shore, and Northern Central railroads; the New York State Barge Canal, and an electric railroad from Rochester to Syracuse. The State Custodial Asylum for Feeble-Minded Women is also located at Newark. The population is about 7,000, not including some 800 inhabitants at the asylum.

The public water supply is owned and operated by the village, and is at present obtained from wells and by pumping from Mud creek. A new supply, however, has been under construction for the past year and will shortly be completed. This supply is obtained from an impounded stream some 7 miles south of Newark. It is intended to filter and chlorinate the new supply. For a period covering the years 1912 to 1918 inclusive, the average number of gallons pumped per day is 340,000 gallons, which corresponds to a per capita consumption of 52.1 gallons per day.

The sewer system consists of about 16 miles of sewers ranging in size from 6 to 18 inches in diameter. The sewage disposal works, consisting of an Imhoff tank, sprinkling filters, and final settling tank, were designed by Mr. J. H. Fuertes, and the plans were approved by this Department on April 17, 1912; and on May 5, 1913, revised plans for a final settling tank were approved. These works were constructed and the Imhoff tank placed in operation in the fall of 1913, and the complete plant was put in operation in April, 1914.

The plant is located in the village about half way between the New York Central and the West Shore railroads, on the right bank of a small stream known as Military brook. The nearest dwelling is owned by the village and occupied by the caretaker at the disposal plant.

The recent inspection discloses that the recommendations of the former reports have been carried out with the exception of the sterilization of the final effluent and the improvement of the distribution upon the filter beds. The engineer was informed that a chemical company, formerly discharging its wastes into the village system of sewers with the result that the proper action of the Imhoff tank was prevented, is now discharging its wastes into the Barge canal, and does not therefore effect the operation of the disposal works.

It was stated that the owner of the property located opposite the cottage owned by the village and occupied by the caretaker at the disposal works, has served notice of intention to file a claim against the village for damages due to the odors arising from the operation of the works. At the time of the inspection no objectionable odors were noticeable from the Imhoff tank or sludge drying bed. There was the usual odor of fresh sewage rising from the trickling filters when they were in operation. A strong west wind, which was said to be the prevailing wind, was blowing at the time. The house in question is located northeast of the plant, and under these conditions could not therefore be seriously affected by odors from the disposal works. This house is located some 400 feet distant from the disposal works.

The Imhoff tank appeared to be operating in a satisfactory manner. There was little or no scum on the gas vents, but evidence of gas ebullition was observed rising to the surface of the gas vents. The Imhoff tank effluent appeared to be clear and did not contain any heavy particles of organic matter.

The plant attendant had not made any record of the readings to determine the depth of sludge in the digestion chamber. For this purpose a Pitcher pump and hose may be used for determining the height of sludge of the digestion chamber. A heavy walled rubber hose 1-inch in diameter is well adapted for this purpose. It probably will be advisable to weight the lower end of the hose or attach the hose to a rod to make certain that it hangs straight down and that the results are accurate. When the hose is introduced into the tank and pumping is started, the surface of the sludge can be easily determined by raising and lowering the hose and noticing when the pump stops discharging water and the discharge of sludge begins.

It is important to ascertain accurately the height of sludge in the sludge compartment of the tanks for several reasons. The quantity of sludge and its distribution throughout the digestion chamber may be determined also by means of the sludge readings and the sludge drawn at such times and as often as is necessary to keep the surface of the sludge at a sufficient distance below the slot to prevent the clogging of the slot.

The effluent from the Imhoff tank flows to a well from which it is pumped intermittently to the siphon chamber and thence onto the trickling filters. The pump is started and stopped by an automatic float block switch. The notch adjustment on the automatic block switch was so changed at the time of the inspection as to increase the time between pumping about one-half minute. The intake well is provided with an overflow weir. In making these adjustments care should be exercised so that no tank effluent is discharged through the overflow weir into the final effluent channel which passes the intake well.

The distribution on the filters was very poor. In examining the filter bed it was found that the nozzles were partly of the square and partly of the circular type. They were covered and clogged for the most part with organic growths in such a manner as seriously to effect the distribution on the beds. The filter media was covered with organic growth, and the presence of psychoda, or moth fly, was noted. The cover on the manhole of the siphon chamber was raised and the operation of the siphon observed, from which it was found that the high water level of the siphon could be raised at least 2 feet so far as the elevation of the cover of the dosing chamber was concerned. It should be pointed out, however, that in raising this chamber it would be necessary to alter the Harding vent and raise the operating siphon of the bell so as to provide a proper amount of air under the changed operating conditions.

At the time of the inspection the circular type of nozzles were giving a better distribution than the square type. A better distribution over the entire bed would undoubtedly be obtained under the existing conditions if the square type nozzles were replaced by circular nozzles.

At present the intermittent pumping of the Imhoff tank effluent into the siphon chamber seriously affects the operation of the siphon, and consequently the distribution on the trickling filters.

The discharge of the pump into the siphon chamber is more than the discharge capacity of the siphon when operating under a low head, and this consequently causes the siphon to continue to operate under a low head, giving a very uneven and heavy overdose of sewage on the filters in the vicinity of the nozzles. This trouble may be eliminated by the installation of a larger siphon with an additional main distributor pipe line.

It was observed that the attendant made a practice of removing the base as well as the cone portion of the nozzle, allowing the sewage to flow in a large volume on the surface of the bed near the distribution pipe. This practice not only causes a heavy overdosing of the filter bed in the vicinity of the nozzles, but may also cause the organic deposits on the inner surface of the distribution system to become loosened by the increased velocity and

the discharge of this organic matter on the surface of the bed causing pooling. The nozzles should be cleaned daily in order to keep them clear and provide for a proper distribution of the sewage over the surface of the beds. The effluent duct from the sprinkling filters was running approximately one-half full.

The distribution system should also be flushed out at least once a month, or as often as experience shows necessary. This can be accomplished by the operation of the valves located in the pipe gallery underneath the filter bed. It will also be possible to flush out the distribution system by means of a hose and water pressure which is supplied near the filter beds.

The final settling tank which receives the trickling filter effluent appeared to be operating in a satisfactory manner. Judging from the lack of any gas bubbles in the final settling tank, there was no septic action taking place. The engineer was informed that particular care is taken to prevent large deposits of sludge in this tank by frequently drawing off the sludge.

The sludge from both the primary and secondary tanks is pumped into the distributing troughs and thence to the sludge bed, which is built above the surface of the ground and enclosed by concrete walls. Underdrains are laid under the bed and the effluent collected by a concrete trough. At the time of the inspection the sludge bed was covered with sludge to a depth of 14 inches, and this sludge was said to have been on the bed for 2 months. It was learned that the bed does not properly drain. This condition should be remedied immediately. The bed was covered at the time of the inspection so that the condition of the bed will not be examined. It should be carefully inspected by the operator in order to determine exactly the cause for the improper draining of the bed. It may be that the underdrains have settled and have become clogged or the sand in the bed may be clogged, or some other trouble may exist which prevents the sludge from draining properly and drying more quickly. Beside drawing sludge on the sludge bed, it has been the practice to pump sludge onto the low land beyond the plant. It should not be necessary to continue this practice if the sludge bed is properly repaired, as the sludge when drawn will dry quickly in fair weather so that it may be removed and additional sludge drawn.

For the matter of keeping a record of operation which will furnish available data, it will be advisable to make a record of the date of removal and the number of cubic yards of wet sludge removed from the tanks. This can be easily determined by measuring the depth of sludge on the sludge bed after its removal from the tank. Also a record of the number of cubic yards of dry sludge removed from the bed, together with the date of removal, should be recorded. This can be ascertained by determining the capacity of the wheelbarrow or wagon used to remove the sludge and by keeping account of the number of loads removed.

The final effluent is discharged into a small stream which has been intercepted by and now discharges into the Barge canal at Newark. There were black organic deposits in the bed of the stream near the point where the effluent is discharged. The stream, at the time of the inspection, had very little flow.

In view of the above the following conclusions may be drawn:

1. That our former recommendations had been carried out in part.

2. That while the sewage disposal plant was being operated in such a manner as to not cause any conditions of nuisance to exist at the time of the inspection, there were, however, several conditions affecting the efficient operation of the plant which were in need of improvement, the more important of which are as follows:

(a) The distribution on the trickling filters;

(b) The cleaning of nozzles which should be done daily;

(c) The cleaning of distribution pipe lines by flushing;

(d) The reconstruction of sludge bed to facilitate the drying of the sludge;

(e) The keeping of records of the operation of the plant.

I would therefore recommend:

1. That the distribution of sewage on the filters be improved as recommended in the former reports; and that as a means of temporarily improving the distribution, the operating high head of the siphon be raised or another larger siphon constructed.
2. That the practice of replacing the present square type of nozzles by others of the round type as they are broken be continued.
3. That the distribution system be frequently flushed as outlined in the report.
4. That the sludge bed be reconstructed in order that the sludge may dry within reasonable time.
5. That records of operation be kept as outlined in the report.

I would further recommend that copies of this report be transmitted to Mr. Stanley Scarth, superintendent; Dr. Frederick C. Donnelly, president of the village, and Dr. A. A. Young, health officer, and to C. R. Hervey, sanitary supervisor.

Respectfully submitted

THEODORE HORTON

Chief Engineer

ALBANY, N. Y., *January* 30, 1920

Copies of this report were sent on January 31, 1920, to the village authorities, to the local board of health, and to the sanitary supervisor.

PLEASANTVILLE (Hebrew Sheltering Guardian Society)

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on an investigation of the operation of the sewage disposal plant at the Hebrew Sheltering Guardian society at Pleasantville, N. Y., made by Mr. Earl Devendorf, assistant engineer in this Department, on December 8, 1919.

This inspection was made as a result of a complaint received from property owners residing near the institution. This complaint stated that periodically conditions of nuisance were created from odors in the vicinity of the plant itself and from the brook into which the effluent is discharged. At the time of the inspection Mr. F. I. Frishberg, business manager of the Hebrew Sheltering Guardian Society, accompanied the engineer in the examination of the operation of the disposal plant.

A previous investigation of this disposal plant was made by a representative of this Department in 1913, and a report setting forth the results of this investigation and describing the plant in detail was published in the Annual Report of that year. The disposal plant, therefore, will not be described again at this time except to state that the plant consists of a three compartment settling tank, dosing chamber, 2 sprinkling filters, final settling tanks, dosing tank, 3 intermittent sand filters, chlorination plant, and auxiliary sludge drying beds for the disposal of the sludge from the primary and final settling tanks.

The institution, which was founded in the interest of destitute Jewish children, is located on the Sawmill river, about one mile east of Pleasantville, on the Harlem division of the New York Central railroad, about 30 miles north of New York city. At the time of the inspection there were 650 children in the institution and the number of attendants was estimated at 100, giving a total population of 750 in the institution.

The water supply for potable purposes at the institution is derived from wells, and the water is pumped into a concrete reservoir from which it is supplied by gravity. Water for laundry and boiler use is derived from the public water supply of the village of Pleasantville.

The sewage at the institution is collected in a separate system of sewers and flows by gravity to the sewage disposal plant located near a small stream

tributary to the Sawmill river, into which the effluent from the disposal plant is discharged. This small stream has a drainage area above the disposal works of about 2½ square miles. The Sawmill river serves as a principal source of the public water supply of the city of Yonkers after filtration and sterilization. The intake of this supply is located at a point some 13 miles below the disposal plant.

The volume of sewage is measured by means of daily readings of a Crosby counter, which gives the number of discharges of a siphon controlling the flow to the sprinkling filters. The volume of sewage is then obtained by multiplying the number of discharges by the volume of the siphon which in this case has been calculated at 2,000 gallons. From a record of the number of discharges of the siphon from December 1 to 7, 1919, the average sewage flow amounted to 78,000 gallons per 24 hours during this period. This corresponds to a daily per capita rate of sewage contribution of 104 gallons.

The sedimentation tank which is housed over is divided into one large and two small compartments and so arranged that the three compartments may be operated in series or in parallel, or separately. It is usual to operate either the large compartment or the two small compartments at one time to facilitate cleaning the tank. Under this arrangement the sedimentation tank will give a detention period varying from 3¾ to 5 hours, depending on the rate of flow of sewage.

The settled sewage is discharged over 2 sprinkling filters having a combined area of .054 acre. The sewage is applied to each filter through 10 nozzles of the Taylor type. Each filter is covered with a frame roof and is enclosed in a structure having concrete walls with openings for the purpose of ventilating the filters. The sprinkling filters are 6½ feet in depth and were being operated at the time of the inspection at a rate of 1,450,000 gallons per acre per 24 hours.

The sprinkling filter effluent is discharged through the underdrain system into 2 final or secondary settling basins, one for each filter. These sedimentation basins have a combined capacity equal to about 2¾ hours flow of sewage with the amount of sewage being treated at the time of the inspection.

The effluent from the final settling basins is discharged by means of siphons to 3 intermittent sand filter beds having a total combined area of .2 acre. In the summer the sewage is distributed by means of channel pipes spaced 5 feet on centers. In the winter, ridges 2½ feet in height and spaced 5 feet on centers are formed on the surface of the bed between which the sewage flows.

The sand filter bed effluent is conducted to the disinfecting plant where it is treated with a hypochlorite solution in a disinfecting well located under the building which houses the disinfecting plant. The sewage has a detention period in this well of about 1 hour. From the well the effluent is discharged directly into the stream.

The sedimentation tank at the time of the inspection appeared to be operating in a satisfactory manner. No objectionable odors were to be noticed in the building housing the sedimentation tank and the tank was discharging a satisfactory effluent, having no visible particles of suspended matter going over to the sprinkling filters. The compartment which was not in use was empty and had been cleaned out. The attendant stated that it was the practice to clean one of the compartments of the tank once a month.

The sprinkling filters were found to be in generally satisfactory condition except that small pools were observed on the surface of the filters. This pooling appeared to be caused by the attendant removing the base as well as the cone of the Taylor nozzles for the purpose of cleaning the nozzles. This practice should be discontinued, as it not only causes a heavy overdosing of the portions of the sprinkling filter beds surrounding the nozzles but might also loosen any organic growths which may adhere to the inner surface of the distribution system by the increased velocity through the pipes, with the result that this matter would be discharged on to the surface of the beds near the nozzle and cause clogging and pooling of the filters. The attendants should be instructed to remove only the cone of a nozzle in cleaning, and to replace the same in as short a time as possible, and thus prevent any over-

dosing of the beds. In places where pooling has already started, it would be advisable to rake over the surface of the beds with a stone fork.

The sand filters were being ridged at the time of the inspection. The two small units were out of service and the large unit had been put in service on the morning of the day of the inspection. The attendant stated that it was the practice to scrape the beds every two weeks and to replace the sand yearly. The amount of sand replaced usually varied from 8 to 10 inches in depth. Each winter the beds have been ridged as described above and no difficulty in operation has been experienced.

The sand filter effluent is chlorinated as described above, and at the time of the inspection the attendant stated that he was using 20 pounds of hypochlorite of lime per 24 hours, which based on an estimated available chlorine content of 33 per cent would give a rate of application of 10 parts of chlorine per million parts of sewage treated with the amount of sewage flowing at this time.

The sludge beds are enclosed in glass-covered houses of hotbed construction. The attendant stated that it was the practice to draw sludge once a month, the amount drawn varying from 10 inches to 1 foot in depth on the two beds which have a total area of 500 square feet. This would give a volume of sludge at each drawing of approximately 500 cubic feet. This sludge, the attendant stated, would dry during the summer weather within two weeks, and in the winter within one month, to such a condition that it could be removed by a spade. The sludge is removed by means of a push-car operated on tracks to trenches where it is buried. At the time of the inspection a slight odor could be detected at a point about 100 feet distant from the sludge trench. There was no odor coming from the sludge beds as they were covered and the doors to the building were closed. In view of this condition it would be advisable for the institution authorities to cover the sludge in the trenches as soon as it is deposited.

At the time of the inspection no samples of sewage or disposal plant effluent were collected for analyses to determine the operating efficiency of the plant. The operation of this plant, however, is carried on under the continuous and careful supervision of Lederle and Provost, consulting engineers of New York city, and the attendant makes daily record of the operating conditions and takes daily samples for the stability tests. Bacteriological samples are collected weekly and analyses made by the engineers. From the records on file at the plant, the final effluent is shown to be stable for the most part. During the month of July the final effluent held its color from 5 to 14 days, and during August from 4 to 10 days.

At the time of the inspection the stream was examined at the point where the final effluent from the disposal plant is discharged. and there was no evidence of pollution either by sewage growth or sludge deposits in the stream itself, or by the presence of any objectionable odors.

In view of the above it may be concluded:

1. That at the time of the inspection the plant was operating in a generally satisfactory manner and not causing any conditions of nuisance.

2. That at the time of the inspection there was no evidence of pollution in the stream below the disposal plant.

3. That in the cleaning of the nozzles of the sprinkling filters it has been the practice to remove both the bases and the cones of the nozzles.

4. That it has not been the practice to cover the sludge deposited in the sludge trenches as soon as the sludge is removed from the sludge beds.

I would therefore recommend:

1. That the institution authorities continue, as in the past, the careful operation of the plant and the employment of expert supervision in order that any changes in conditions will be met by proper changes in the operating methods.

2. That in cleaning the nozzles on the sprinkling filters the cone portion only of the nozzle should be removed, and if any pooling should occur the surface of the stone should be loosened with a stone fork.

3. The sludge when deposited in trenches should be covered immediately with soil to a depth of not less than 12 inches.

I would further recommend that copies of this report be sent to the institution authorities, to the complainant, Dr. James Wilson Cassell, and to the local health officer, and sanitary supervisor of the district.

Respectfully submitted

THEODORE HORTON

Chief Engineer

ALBANY, N. Y., *January* 16, 1920

Copies of this report were sent in accordance with the above recommendations on January 16, 1920, to the institution authorities, to the complainant, to the health officer, and sanitary supervisor. On January 27, 1920, a communication was received from institution authorities stating that the recommendations of the report would receive immediate attention.

RENSSELAER COUNTY TUBERCULOSIS HOSPITAL

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on an inspection of the sewage disposal plant at the Rensselaer County Tuberculosis Hospital, at Wynantskill, made by Mr. W. C. Emigh, assistant engineer in this Department, on November 1, 1920.

This investigation was made as a result of a request from Dr. Frank L. S. Reynolds, superintendent of the hospital, for advice relative to the operation of the disposal plant. The hospital has a capacity of 202 patients and 60 employees. At the time of the investigation there were 151 patients and 51 employees. Of the patients, 85 were men, 41 women, and 25 children. The area of the institution property is about 150 acres.

The records of this Department show that plans for water supply, sewerage and sewage disposal for the Rensselaer County Tuberculosis Hospital were approved June 20, 1917. The water supply as shown on these plans was to be derived from driven wells located about 150 feet from a pond in the eastern portion of the property. At the time of the approval of the plans information was received by the Department to the effect that the soil at the location of the wells consisted of 2 feet of top soil, 30 feet of gravel, 40 feet of hardpan, 1 to 3 feet of fine sand, and 10 to 12 feet of shale rock. The ground water table was at an elevation of about 7 inches above the water surface of the pond, thus indicating that the general direction of flow was from the wells toward the pond. At the time of the investigation the water consumption was estimated by the engineer of the institution to be approximately 18,000 gallons per day.

The approved plans for sewerage and sewage disposal provided for the collection of the sewage from the hospital buildings in tile sewers from 4 to 8 inches in diameter, and for the disposal of the sewage in a sewage disposal plant consisting of a settling tank and a subsurface irrigation field. The settling tank was to be 15 feet by 40 feet in plan, with a depth below the center of the outlet pipe of 5 feet. It was divided into two equal compartments by a longitudinal partition wall. A capacity of nearly 22,000 gallons was thus provided if no allowance be made for space occupied by sludge. This is approximately equal to the estimated water consumption of the institution per 24 hours and somewhat in excess of the present consumption. The two compartments of the tank were designed to operate in parallel. A valve was provided on the pipe entering each compartment. A concrete curtain baffle was to extend across each compartment, 4 feet from the tank wall at the inlet end. A submerged outlet was provided. Access to the tank is afforded by a rectangular manhole at the inlet end and 2 circular manholes at the outlet end. A pipe line from each compartment joining a

few feet outside of the tank provides a means for removing accumulated sludge to the sludge drying bed located at a distance of about 350 feet from the tank.

From the tank the settled sewage was to flow through a short line of pipe into a concrete distributing channel and thence into lines of 3-inch agricultural tile laid about 18-inches below the ground surface. There are 42 lines of tile shown, each 200 feet long, 21 lines extending in a northerly direction from the distributing channel and an equal number from opposite points of the channel in a southerly direction. The distributing channel is shown on a considerable slope, and in order to fill all lines of tile without producing a large hydrostatic head in any line, weirs are shown about 18 inches below each pair of lines of lateral distributing tile. These weirs were so designed as to raise the water level behind them about one inch above the top of the lateral tile. The tiles were to be laid with ½-inch open joints covered with three-ply tar paper on a bed of coarse sand and gravel and with a slope of 4 inches in 100 feet.

At the time of the investigation it was found that in general the sewage disposal plant had been constructed in accordance with the plans but that in some details the construction was at variance therewith. In the easterly compartment of the settling tank there was about 6 inches of scum, whereas in the westerly compartment there was practically no scum. Only a few inches of sludge was found in the tank. It was stated by the chief engineer of the institution that at the time of cleaning the tank in the spring of 1920 the conditions as regards relative quantities of scum in the two compartments were reversed, the greater quantity at that time being in the westerly compartment. It is further stated that sludge had not been removed from the tank during the summer or fall of the current year.

In the distributing channel sewage was flowing over 18 of the 20 weirs. Sewage was passing under or around the ends of the two remaining weirs, which resulted in cutting out the 4 lines of tile intended to be submerged by these two weirs.

The ground surface slopes in an easterly direction. A few feet beyond the lowest line of tile it drops off steeply. At a point near the northerly end of this line the brow of the hill approaches to within a few inches of the tile. At this point sewage was rising to the surface of the ground and flowing down the embankment to a depression from which there was no surface outlet. The point at which the sewage was rising to the surface is about 700 feet from the location of the nearest proposed well as indicated on the approved plans, and the depression in which the sewage was absorbed is about 500 feet from the same well. A ridge rising about 12 feet above the depression separates it from the well. The ground surface of the well is about 20 feet below that of the depression.

Upon removing the gravel to a depth of about 6 inches below the surface, it was found that one length of tile was about 3 inches out of line and had been broken. No tar paper was found over the joints. It is possible that the proximity of the tile at this point to the brow of the hill and to the surface of the ground resulted in displacement of the tile at the time of some movement of the gravel over a limited area. Our engineer was unable to determine the relative quantities of sewage entering the distributing channel and flowing through this break, but it appeared that at least half and perhaps a considerably larger proportion was thus escaping to the ground surface.

A section of tile was uncovered at a point near the northern extremity of another of the northerly lines of tile. No tar paper was found at the joint, and it did not appear that sewage had ever reached that point of the field. It would thus appear that there is either a stoppage in this line or that the extremity of the line is at a higher elevation than the point of entrance of sewage.

A third point was uncovered just north of the distributing channel and about one-third of the way from the westerly to the easterly side of the field. Tar paper was found at this point but the tile joint was so tight

that sewage which was standing in the tile was unable to escape into the excavation until the joint had been opened slightly. It was stated by the superintendent of the hospital that in the past sewage has reached the surface at points in the field which are now dry. It thus appears that at some points the tile is not properly laid but to what extent this condition existed it was impossible at the time of the recent investigation to determine.

In view of the conditions found to exist at the Rensselaer County Tuberculosis Hospital at the time of the recent investigation, and after a careful comparison of these conditions, together with the plans for the sewage disposal plant as approved by this Department, it appears:

1. That the plant was not constructed entirely in accordance with the approved plans.

2. That the present unsatisfactory operation of the plant is in some measure due to this departure of construction from design.

3. That at one or more points of the subsurface irrigation field the tile is not provided with sufficient covering of earth.

I would therefore recommend:

1. That the institution authorities cause each line of agricultural tile to be uncovered at intervals not to exceed 25 feet in order that information may be obtained as to the condition of each line.

2. That the services of a competent engineer experienced in this type of construction be secured and that such engineer examine the condition of the tile as to openings provided at joints, the elevation and slope of the tile, and such other particulars as may bear upon the efficiency of operation and conformity to the approved plans.

3. That the tile be repaired or relaid so far as the findings of such an investigation prove necessary.

4. That at the point at which sewage was rising to the surface of the ground at the time of the investigation, the tile be properly relaid and sufficient material placed over and around the tile to provide about 18-inch cover and at least 2 feet on the lower side of the tile.

Respectfully submitted

THEODORE HORTON

Chief Engineer

ALBANY, N. Y., *November* 22, 1920

Copies of this report were sent on November 22, 1920, to the superintendent of Rensselaer County Tuberculosis Hospital and to the sanitary supervisor.

SCHENECTADY COUNTY TUBERCULOSIS HOSPITAL

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report upon the results of a field inspection of the Schenectady County Tuberculosis Hospital, in the town of Glenville. Schenectady county, N. Y., on July 20, 1920, made upon the request of the Supervisor of the Division of Tuberculosis of this Department, to whom the hospital superintendent had complained by telephone on July 15, 1920, concerning the costly upkeep and unsatisfactory operation of the disposal plant.

This institution is about 4 miles northeast of the city of Schenectady, in the Mohawk valley, on high ground at the Indian Creek fork of Alplaus kill, from which former stream the water supply for the institution is taken. The intake of the water supply is above a dam about half a mile higher upstream than the point of entry of the effluent from the disposal works.

Original plans for a disposal plant for this hospital were approved by this Department on May 2, 1911. They contemplated the disposal of the sewage from a population of 60 persons by tank treatment followed by sub-

surface irrigation. Following an increase in capacity of this hospital, on October 22, 1914, plans were approved for the treatment of the sewage from an estimated future population of 100 per sons by tank treatment, followed by sprinkling filters, secondary settling tanks, and intermittent sand filters. The design was based on an estimated flow of sewage of 5,000 gallons per day.

These plans last mentioned showed that the former tanks and dosing chamber were to be made into one tank by the removal of an intervening partition. Our report on the examination of these plans pointed out that the detention period for settlement would thus be increased. The report of the designing engineer of September 28, 1914, stated that the form of tank bottom would be changed to facilitate blowing off sludge, and advised the replacement of this tank with an Imhoff tank as soon as funds permitted, and stated that the design was based on a present 12-hour detention in the primary settling or septic tank and 2 hours in the final settling tank.

The superintendent stated that the sprinkling filter required very frequent cleaning at great cost, and seemed to operate but a short time before it clogs up with black deposits which it was claimed were formerly responsible for the clogging of the former subsurface irrigation system. These black deposits are also discharged with the sprinkling filter effluent and rapidly stopped up the sand beds, requiring constant raking and frequent renewal of sand. He also stated that particles of solidified grease seemed to pass through the system and stop up the sprinkler nozzles so that it is necessary to clean them every hour or to put on homemade nozzles with larger orifices but less distributing area to which he had been obliged to resort.

He reported that the sprinkling filter had been cleaned this spring and showed our engineer a pile of small stones and dust about 3 feet high mostly capable of passing a half-inch ring, which had been screened out and replaced with 6-inch stone placed around the underdrains. In spite of this the clogging had continued, so that the top few feet of the stone beds had to be washed out by fire hose only a week or so before. He also reported that the primary settling tank when cleaned this spring had about 3 feet of solid scum on it, and that practically all the rest of it was filled with a molasses-like mass of sludge so thick that it could be bailed out with a bucket containing half-inch holes.

The plumber at the institution reported that caked or congealed grease was not only found at the sprinkler nozzles but was found in all the manholes below the administration building. He picked out a sample of congealed grease lying on the half-inch mesh screen which he had placed between the discharge from the septic tank and the dosing chamber serving the sprinkling filter. He also showed how it had quickly clogged a mosquito screen which had apparently been tried in this position.

The plumber stated that the interval between siphon discharges to the sprinkler bed was between 15 and 60 minutes during the day, but somewhat less at times when washing or such work was being done. The head nurse gave some information from which the amount of soda and soap used in the administration building was deduced, and also stated that liquid soap was used in the hospital buildings, one or two 5-pint bottles a week being distributed to the five principal buildings, so that it would seem from this that about 6 pounds of soap per day was being used at points other than the administration building in addition to the soap in the moppings from the floors of all the buildings which also pass into the sewer.

The population at present consists of between 70 and 90 patients, who with about 20 employees and attendants make a present total average population about 100. The flow of sewage according to data furnished by the superintendent of the institution ranges from 6,000 to 10,000 gallons per day, which is from 20 per cent to 100 per cent higher than that for which the disposal plant was designed. It is planned to install an additional building for 20 patients, which will bring the total population at the institution up to some 130 counting attendant employees.

Sewerage System

The sewers serving the various buildings vary in size from 4 inches to 5 inches in diameter. They appear to be laid on a comparatively flat grade to the first manhole on the line to the disposal works, after which the slopes appear to be steeper. The maximum length of the branch sewers is about 600 feet, while the length of the 6-inch outfall is slightly longer.

The first point on the sewer system observed was the grease trap at the main building. The dimensions of this trap are about 6 feet long by 6 feet wide by 3½ feet deep, giving a capacity of 950 gallons. There is also an end chamber 1½ feet long connected with the trap which has a capacity of 250 gallons. The partition between the two chambers is perforated by a downturned elbow which discharges from a point a foot or more below the surface of the effluent from the larger chamber. The grease trap had been cleaned only about a week before the time of the examination, and there was only about 2 inches of scum in the large chamber and not more than 1/16 of an inch in the small chamber.

The largest contribution to the contents of the grease trap is the discharge from the kitchen of the administration building where the cooking and dish washing for the entire hospital is done. There appears to be used daily on the average about 5 pounds of soda and 2 or 3 pounds of soap powder, and possibly 3 pounds more of homemade soap and ivory soap in the kitchen. It was found that the intake pipes to this grease trap passes for a distance of 10 or 15 feet through a very hot basement room in which is located the high pressure boiler, and that the wall of the grease trap adjoins the wall of the administration building opposite which is located this boiler room. It appears, therefore, that the piping and grease trap are so located as to inhibit to a large extent the proper operation of the trap and the effective removal of the grease from the kitchen wastes.

The sewer pipes so far as could be observed from manholes were open and in good condition, the flow through the pipe when observed at 10 A. M. being about half an inch deep in most cases. Particles of caked white grease were, however, to be found in the manholes, and it was learned that there had been occasional stoppages of sewers due to grease. The ventilated covers of the manholes had no buckets beneath them, so that in addition to the stoppage from grease and slight grades occasional tendency to stop might be produced by careless opening of the manhole and the deposition therein of the dirt adhering and surrounding their covers.

Disposal Plant

The sewage disposal plant consists of a settling tank, sprinkling filter, secondary settling tank, sand filters, and auxiliary dosing tanks. From measurements made of the plant, the settling tank was found to be 12 feet long and 4 feet deep by about 4 feet wide at the lower end and 8 feet at the upper end. The contents of the tank when clean is about 2,600 gallons, giving an average detention period of about 5 hours for a flow of 10,000 gallons per day. The minimum detention period is probably only about 2 or 3 hours at times even when the tank is clean. The adjoining dosing chamber has hydraulic dimensions of 2 feet 6 inches square by 3 feet deep, which with the allowance for the bell gives it a dosing discharge capacity of about 120 gallons.

The sprinkling filter is 36 feet long by 9 feet 6 inches wide and has an area of 342 square feet, or .0079 acre. The volume of the sprinkling filter, which is about 6 feet deep, is approximately 2,050 cubic feet, or .047 acre of filter 1 foot deep, which gives a rate of filtration of 200,000 gallons per acre per day per foot of depth, or 1,250,000 gallons per day per acre of filter when treating 10,000 gallons of sewage per day. The 4 sprinkler nozzles are located 9 feet 6 inches apart. The radius of the maximum are reached by the discharge of the nozzles about 2 feet 6 inches so that only about one-fourth of the area of the filter was in effective use due to the unsatisfactory distribution provided by the nozzles.

The secondary settling tank following the sprinkling filters is 4 feet wide by 2½ to 4½ feet long by 5 feet 6 inches in hydraulic depth. It has, therefore, a maximum content of about 600 gallons, and provides a detention period of 1 hour and 25 minutes based on the rate of flow of 10,000 gallons a day. Attached to the secondary settling tank is the dosing tank having a width of 4 feet, a length of 2 feet 6 inches, and a depth of about 2 feet 10 inches, giving it a hydraulic capacity of about 200 gallons. This tank is provided with an automatic discharge siphon which discharges the contents of the tank intermittently to the sand filters.

The sand beds were designed with a depth of 2 feet 6 inches, but the depth had been reduced by scraping off about 2 feet. The beds were slightly lower at the concrete slabs under the discharge pipes than they were at the far ends. There are 4 of these sand filters, approximately 12 feet 11 inches by 17 feet 6 inches in size, giving them an area each of about 226 square feet, or .005 acre, or a combined area for the 4 beds of .02 acre. The discharge from the dosing tank to the sand filters is sufficient to cover one bed to a depth of 1.4 inches. The rate of filtration based on a flow at the rate of 10,000 gallons a day for all 4 filters is about 500,000 gallons per acre per day. This rate of operation is excessive, and can only be maintained by the most careful supervision. If the proposed addition to the hospital is constructed and the population increased, it will be necessary to install at least one more bed of the same size as one of the existing beds.

The effluent pipe from the underdrains of the sand filters discharges through some 200 feet of pipe into Indian Brook. The effluent is nearly clear and colorless, and the plant appeared to produce satisfactory results although it requires constant attention.

Operation During Inspection

At the time of the inspection there was about 6 inches of scum on the settling tank and a considerable amount of sludge which appeared to be disturbed on account of the comparatively shallow depth and small size of the tank. When the siphon serving the sprinkling filter discharged only 1 of the 4 nozzles worked. The examination of the other 3 nozzles showed that they were stopped up with particles of white caked grease from ⅛ to ½ inch in diameter, and the removal of the nozzle and the grease was followed by the discharge of sewage containing large particles of black matter. Considerable solids were also deposited in the sand beds from the discharge of the second dosing tank. The discharge on to the 4 sand beds is not automatically controlled, but either 1, 2, 3, or 4 could be arranged to be dosed at the same time.

At the time of observation 2 of the sand filters were flooded to a depth of about 6 inches and very little subsidence was noticeable in the water. About half the area of each of the two beds in use was covered with black deposit, although the filters had been cleaned but a day or two before. Samples of this black filter deposit as well as of the white caked grease were obtained, and excavation was made in the stone beds revealing a fairly congested or solidified and earthy condition accompanied by the usual presence of earth worms at a depth of about 1½ feet at a point midway between the sprinkler nozzles.

The inspection also showed that owing to a material increase of population above the population of 60 for which the tank was originally designed, the present nature of the sewage and grease, and the nearly doubled rate of contribution, the average hydraulic content of the shallow primary settling tank available for storage has been relatively reduced so that the designed period of tank detention is not attained. It was found, further, that steam dishwashers and apparatus using soap powders had been introduced into the administration building, and that in addition to this condition the piping and grease trap serving the kitchen are so located as to heat the pipes and trap and make the trap inefficient in the removal of grease.

The inspection revealed that grease passed this trap, caked in the sewers, and clogged the sprinklers so that open nozzles with 2½-foot throw had been

substituted for the 5-foot throw nozzles originally installed, greatly lessening the area of the bed actually in use, and that 3 out of 4 of these sprinklers were stopped at the time of the inspection. This concentrated and unequal distribution, in combination with the faulty tank action, permitted the escape of very numerous particles of suspended matter, had led to a rapid clogging of the stone bed and the passing of black coagulant masses of suspended matter through the final settling tank into the sand filter surface. This made constant and costly cleaning of the beds and tanks necessary.

In conclusion, I would state that it was found from the inspection that the grease trap at the institution is not so placed and arranged as to secure uniformly the congealing of greases from the kitchen, and that certain portions of the plant have been overtaxed by the large rate of flow now obtaining. The present preliminary settling tank was designed to care for a population of 60 persons and provide for a preliminary treatment in connection with a small subsurface irrigation system which was outgrown and abandoned, and the adoption of the tank for the present disposal system was rather of a temporary nature as it was expected by the designing engineer that a two-story tank would be substituted for it after the final installation of the present plant. The population tributary to the plant has nearly doubled since the tank was installed. The nozzles of the sprinkling filters were found to be of an inferior type which did not give a satisfactory distribution and the frequent clogging of the nozzles still further reduced the efficiency of the sprinkling filter. Furthermore, the sand filters have been outgrown and are now treating more sewage than they were designed to care for. Furthermore, if the institution is enlarged, this portion of the plant will be greatly overtaxed.

In view of the above I would make the following recommendations:

1. That a second grease trap similar to the present existing grease trap be placed beyond the present grease trap at a distance from the heated pipes and buildings, and that the effluent from the existing grease trap be led through this second trap, the outlet from which should be submerged one-third the wetted depth of the grease trap.
2. That the present primary settling tank which has been outgrown be abandoned, and that as originally recommended by the engineer designing the plant, a new two-story primary settling tank of adequate size properly to care for the contemplated future population of the hospital be installed.
3. That new standard circular throw sprinkler nozzles suitable for distributing the sewage over the entire area of the sprinkling filter be at once provided in duplicate, and maintained in use at times by sufficient attention regardless of any frequency of obstruction by grease or other matter.
4. That if a total population in excess of 100 be contemplated in the near future, at least one more sand filter having a size equal to that of one of the existing filters be installed.
5. That a competent sanitary engineer be employed to draw up plans for changes, additions, or modifications in the sewerage and sewage disposal systems, and that such plans be submitted in duplicate to this Department for approval as required by the Public Health Law before any changes, additions, or modifications are made in the disposal plant.

Respectfully submitted

THEODORE HORTON

Chief Engineer

ALBANY, N. Y., *September* 22, 1920

On September 22, 1920, a copy of this report was sent to the superintendent of the Schenectady County Tuberculosis Hospital.

In addition to the foregoing, inspections were made and reports transmitted to the local authorities, or advice was given through correspondence with reference to the disposal of sewage at the following places: Beekman (town), Sylvan Lake Camp for Girls; Berne (town), Camp Orinsekwa; Brockport; Hopkinton (town), Ayrmont Dairy Company; Long Beach; Rome (State Institution for Feeble-Minded Children); Seneca Falls; Stamford; Thiells (Letchworth Village).

INVESTIGATION OF MILK PASTEURIZING PLANTS

The investigation of the construction, sanitary conditions, equipment, methods of operation, and efficiency of milk pasteurizing plants was continued during 1920. The force available for this work for 1920 was reduced to one inspector, and owing to illness and special emergency work his services were available for only a part of the year. It was possible, nevertheless, to make 260 inspections and reinspections during this year. This number includes 54 milk pasteurizing plants which ship milk or cream to New York city, and also 95 plants pasteurizing milk in Buffalo which were inspected toward the end of this year but upon which no reports had been made up to the end of the year.

As in previous years, in the case of each plant inspected, except those which ship to New York city, a report setting forth results of the inspection and making recommendations for improvements in the method of operation, equipment, and construction of each plant was transmitted to the plant owner and to the local health authorities.

Of the plants inspected, 23 have permanently discontinued pasteurization of milk, 2 have temporarily discontinued pasteurization, and 1 has discontinued the sale of milk and cream in this State since 1919. Of the 23 plants which have permanently discontinued pasteurization, 12 still serve as bottling plants. At these plants the raw milk is taken by the dealers to a milk pasteurizing plant where it is pasteurized. After it has been pasteurized, the milk is transported in cans to the bottling plants, where it is strained through cheesecloth over the bottle filler. It is then bottled, and in most cases capped by hand, after which it is delivered to the consumer. This method of

handling pasteurized milk is not satisfactory, and unless the operator observes special precautions as regards sanitary conditions and transportation and in method of handling, the milk is liable to contamination. The owners of the remaining 11 plants which have discontinued pasteurization have combined to form two large companies.

Of the pasteurizing plants inspected last year, 19 were not reinspected this year. According to recent information from health officers, there are also 32 plants pasteurizing milk for local consumption which have not been inspected by this Department. These plants have been placed on our list for inspection in the near future.

From the inspection work in this State it has been found that there are the following four distinct methods used in the pasteurization of milk and cream:

1. Pasteurization by the continuous method;
2. Pasteurization by the batch method;
3. Pasteurization by the "in bottle" method;
4. Pasteurization in the milk can.

The accompanying table indicates that of the 197 plants inspected, 47 plants pasteurize by the continuous method, 89 by the batch method, 60 by the "in bottle" method, and 1 by the can method. From the foregoing it is obvious that the practice of pasteurizing in the can has been practically abandoned. This is due to the impracticability and inefficiency of the method.

Comparing the results of the work of the year 1920 with those of the years 1918 and 1919, from the standpoint of the percentage of all recommendations made for improvements previous to or during that year which had been carried out at the close of that year, it appears that in 1918, 41.1 per cent of our recommendations had been carried out; in 1919, 46.3

per cent had been carried out; and in 1920, 49.1 per cent had been carried out. The foregoing shows that although there was an increase of 5.2 per cent in the year 1919 over the year 1918, the increase in the year 1920 over the year 1919 was only 2.8 per cent.

The accompanying table covering the work of inspections of milk pasteurizing plants is self-explanatory.

MILK PASTEURIZATION PLANTS INSPECTED IN 1920, EXCLUDING THOSE WHICH SHIP TO NEW YORK CITY

Plant No.	Location	Name	Milk in quarts handled daily	Number of dairies served by plant	Date of original inspection	Total number of recommendations made	Process used in pasteurization	Grade after pasteurization	Number reinspections made up to 1/1/20	Number recommendations carried out to 1/1/20	Number recommendations not carried out to 1/1/20	Number reinspections from 1/1/20 to 1/1/21	Number recommendations carried out from 1/1/20 to 1/1/21	Number recommendations not carried out to 1/1/21	Percentage improvements to 1/1/21 on basis of recommendations carried out
1	Albany*	Golding & Tompkins	3,000	36	1/17/17	32	Cont.	B	3	20	12	1	3	9	71.9
2	Albany	Rensselaer Dairy Co.	2,000	10	1/18/17	28	Batch	B	5	6	22	1	Temp	orarily	discont'd
3	Albany	The Boulevard Dairy Co.	2,800	35	8/ 8/17	14	Cont.	A & B	3	10	4	1	......	4	74.1
4	Albany	The Normanskill Farms Dairy	7,200	75	1/16/17	21	Batch	A & B	4	8	12	1	6	7	66.7
5	Amsterdam	Nadler Bros.	5,000	70	9/10/18	16	Batch	A & B	2	8	6	1	2	4	62.5
6	Amsterdam	Joseph Olbrych	1,600	13	9/10/18	15	Batch	B	3	9	6	1	......	6	60.0
7	Amsterdam	John Sager	1,000	10	7/ 6/17	22	Batch	B	4	15	7	1	......	7	68.2
8	Arcade†	Merrell-Soule Co.	45,000	500	2/11/18	4	Batch	B	1	4	......	1	4	......	100.0
9	Arkport†	Arkport Creamery Co.	4,000	100	2/15/18	16	Batch	B (cream)	2	2	14	1	......	14	12.5
10	Auburn	Auburn Sanitary Milk Co.	4,000	30	10/23/17	24	Batch	A	2	11	13	1	2	11	54.1
11	Ballston Spa	Ballston Spa Creamery Co.	6,000	150	9/23/18	20	Batch	B	3	8	12	1	......	12	40.0
12	Batavia	Warren Fargo	1,600	14	1/17/18	17	Batch	A	3	5	12	1	1	11	42.9
13	Berlin‡	Berlin Milk Cond. Co.	1,500	25	11/18/18	13	Batch	B	1	......	13	1	4	9	30.8
14	Johnson City (Binghamton)	T. W. Schoonover	1,600	11	4/17/17	21	In can	B	4	7	14	1	3	11	47.6
15	Binghamton	Cloverdale Creamery	5,500	120	4/17/17	16	Batch	B	3	5	11	1	8	3	81.2
16	Binghamton	Crowley Milk Co.	8,500	107	6/ 5/20	14	Batch	B	......	......	......	......	......	14	......
17	Binghamton	Holtailing Dairy Co.	1,900	15	6/ 7/20	14	Cont.	B	......	......	......	......	......	14	......
18	Buffalo§	Bernhard Ball	450	4	12/13/17	8	In bot.	B	2	6	2	1	1	1	87.5
19	Buffalo	T. A. Beal & Sons	3,000	27	12/21/20	6	Batch	B	......	......	......	......	......	6	......
20	Buffalo	W. H. Beal	450	5	1/ 9/18	13	Batch	A	2	4	9	1	3	6	53.8
21	Buffalo	F. W. Becker	300	3	12/16/20	11	In bot.	A	......	......	......	......	......	11	......
22	Buffalo	Paul Blessing	300	5	9/10/18	15	In bot.	B	2	9	6	1	1	5	66.6
23	Buffalo	W. W. Boynton	225	3	1/ 5/18	10	In bot.	A & B	2	5	5	1	......	5	50.0
24	Buffalo	R. A. Brown	920	9	2/13/18	15	Batch	B	2	10	5	1	1	6	33.3
25	Buffalo	G. A. Bush & Son	540	5	11/23/17	11	Batch	A	3	4	7	1	1	8	27.2
26	Buffalo	T. H. Covey & Co.	875	8	2/ 8/18	15	Cont.	B	2	8	7	1	1	8	46.6
27	Buffalo	Christopher & Riley	250	2	11/12/17	16	Batch	B	2	7	9	1	2	7	56.3
28	Buffalo	Charles H. Coley	2,200	30	1/ 7/18	14	In bot.	A & B	2	6	6	1	1	5	46.3
29	Buffalo	James Darling	480	7	2/ 9/18	11	In bot.	A	2	5	6	1	1	5	54.5
30	Buffalo	George Ditzel	420	3	11/21/17	16	Batch	A	2	7	9	1		9	43.7
31	Buffalo	Dodds Alderney Dairy	2,600	26	1/ 4/18	14	In bot.	A & B	2	11	8	1		8	78.5

32	Buffalo	David Donald	350	2	12/13/17	13	Cont.	A & B	2	7	6	1	......	6	57.1
33	Buffalo	William G. Dunn	220	5	9/10/18	14	In bot.	A	2	8	6	1	3	8	33.4
34	Buffalo	John Follett	3,200	10	12/13/17	13	Cont.	B	2	8	5	1	3	4	77.7
35	Buffalo	H. C. Geenen	480	4	1/ 7/18	18	Batch	B	2	11	7	1			
36	Buffalo	F. W. Gernold	350	6	12/21/20	10	In bot.	B	......	......	......	......	......	10	......
37	Buffalo	Frank Gmereck	250	3	9/ 5/18	9	In bot.	B	2	5	4	1	2	3	66.6
38	Buffalo	F. H. Greenwald	900	13	6/ 9/19	15	Batch	A & B	......	......	......	1	4	11	26.6
39	Buffalo	Frank J. Grath	1,500	18	2/ 7/18	16	Batch	B	2	14	2	1	1	3	81.2
40	Buffalo	Peter Hagner	2,300	16	12/11/17	17	Cont.	A & B	2	9	8	1	2	6	64.7
41	Buffalo	Haid Bros.	550	5	11/20/17	18	Cont.	B	2	8	10	1	2	8	55.5
42	Buffalo	Henel Bros.	300	2	9/ 9/18	21	Batch	A	1	4	17	1	11	6	71.4
43	Buffalo	Hess & Bement	900	11	11/22/17	7	In bot.	A	2	6	1	1	......	1	85.7
44	Buffalo	J. E. Heim	400	5	12/12/17	8	In bot.	A & B	2	5	3	1	1	2	75.0
45	Buffalo	Hoen & Sturm	640	5	11/17/17	19	Batch	B	2	6	13	1	6	7	63.1
46	Buffalo	Henry Hutt	1,920	21	1/ 8/18	16	Batch	B	2	10	7	1	2	5	68.7
47	Buffalo	W. L. Johnson	800	8	1/ 3/18	10	In bot.	A & B	2	9	1	1	1	......	100.
48	Buffalo	R. W. Jones	2,880	30	11/17/17	19	Batch	A & B	2	16	3	1	......	3	84.2
49	Buffalo	M. Jasinsky	300	4	2/13/18	14	Batch	A	2	4	10	1	4	6	57.1
50	Buffalo	J. T. Lannen	400	5	11/22/17	12	In bot.	B	2	4	8	1	1	9	25.
51	Buffalo	Fred Kromke	350	3	12/16/20	11	In bot.	B	......	......	......	......	......	11	......
52	Buffalo	F. Lauterschlager	375	3	12/12/17	11	Cont.	B	2	5	6	1	2	4	63.6
53	Buffalo	Geo. Miller	200	4	12/15/20	9	In bot.	B	......	......	......	......	......	9	......
54	Buffalo	J. Mallon	320	3	2/ 8/18	14	In bot.	B	2	10	4	1	1	5	64.2
55	Buffalo	J. Milligan	450	8	1/ 9/18	14	In bot.	B	2	9	5	1	1	6	57.1
56	Buffalo	J. Niebauer	670	7	2/14/18	16	Cont.	B	2	9	7	1	2	5	68.7
57	Buffalo	S. F. Olesniesak	250	3	11/18/19	10	In bot.	B	......	......	......	1	2	8	20.0
58	Buffalo	Thomas Osborn	580	6	9/ 7/18	18	Batch	B	2	14	4	1	3	7	61.1
59	Buffalo	Orlowsky Milk Co.	800	8	2/11/18	16	Cont.	B	2	7	9	1	2	7	56.2
60	Buffalo	People's Milk Co.	17,000	75	11/20/17	9	Cont.	A & B	2	4	5	1	1	4	55.5
61	Buffalo	C. G. Pfau	160	1	2/ 7/18	11	In bot.	B	2	5	6	1	......	6	45.4
62	Buffalo	A. E. Pirk	200	1	9/10/18	17	In bot.	B	2	12	5	1	......	5	70.5
63	Buffalo	G. Puerner	300	5	2/ 6/18	12	In bot.	B	2	7	5	1	1	4	66.6
64	Buffalo	C. A. Puff	4,000	25	11/22/17	17	Batch	B	2	8	9	1	4	5	70.5
65	Buffalo	Rasp & Miller	475	7	2/11/18	16	Cont.	B	2	8	8	1	2	10	37.5
66	Buffalo	J. Repschlager	600	7	11/21/17	12	In bot.	B	2	10	2	1	1	3	75.0
67	Buffalo	T. M. Rockwood	250	3	1/ 9/18	12	In bot.	A	2	6	6	1	1	5	58.3
68	Buffalo	Geo. Rolling	400	4	11/24/17	15	In bot.	A	2	8	7	1	1	6	60.0
69	Buffalo	R. Sauerwein	1,000	12	1/ 8/18	14	In bot.	A & B	2	9	5	1	2	3	78.5
70	Buffalo	Louis Schafer	300	4	11/19/19	7	In bot.	B	......	......	......	1	4	3	57.1
71	Buffalo	A. A. Schreiber	500	8	2/11/18	15	Batch	B	2	3	12	1	3	9	40.0
72	Buffalo	Scotland Pugh	350	3	1/ 4/18	12	In bot.	A & B	2	7	5	1	3	2	83.3
73	Buffalo	Louis Seibert	250	3	2/13/18	18	In bot.	B	2	13	5	1	2	7	61.1
74	Buffalo	Gottlieb Seibert	800	8	2/ 6/18	15	Batch	B	2	11	4	1	1	3	80.0
75	Buffalo	William C. Seibert	300	4	12/ 6/20	6	Batch	A & B	......	......	......	......	......	6	......
76	Buffalo	G. W. Shero	480	5	11/22/17	18	Cont.	A & B	2	11	7	1	1	8	55.5
77	Buffalo	W. W. Shoemaker	600	6	11/22/17	10	In bot.	A & B	2	8	2	1	......	2	80.0

* Now branch of the Boulevard Dairy Co. of Albany.
† Milk separated and cream pasteurised.
‡ Now branch of the Normanskill Farms Dairy.
§ Plants inspected at the end of 1920 but not reported upon.

MILK PASTEURIZATION PLANTS INSPECTED IN 1920, EXCLUDING THOSE WHICH SHIP TO NEW YORK CITY — (*Continued*)

Plant No.	Location	Name	Milk in quarts handled daily	Number of dairies served by plant	Date of original inspection	Total number of recommendations made	Process used in pasteurization	Grade after pasteurization	Number reinspections made up to 1/1/20	Number recommendations carried out to 1/1/20	Number recommendations not carried out to 1/1/20	Number reinspections from 1/1/20 to 1/1/21	Number recommendations carried out from 1/1/20 to 1/1/21	Number recommendations not carried out to 1/1/21	Percentage improvements to 1/1/21 on basis of recommendations carried out
78	Buffalo	J. M. Sparks	13,000	51	11/23/17	17	Batch	B	2	9	8	1	1	7	58.8
79	Buffalo	Henry Sprenger	640	6	12/15/20	10	Cont.	B	......	......	......	......	......	10	......
80	Buffalo	Oscar Steffan	675	8	1 8/18/	21	Batch	B	2	12	9	1	4	5	76.1
81	Buffalo	W. F. Steffan	600	7	1/21/17	14	Batch	B	2	4	10	1	4	6	57.1
82	Buffalo	Stock Farm Dairy Co.	1,000	4	11/16/17	18	Batch	B	2	11	7	1	1	8	55.5
83	Buffalo	M. Strobel	1,900	28	11/13/19	6	Cont.	B	......	......	......	1	1	5	16.6
84	Buffalo	Stanley Sulkowsky	300	4	2/ 8/18	10	In bot.	B	2	6	4	1	2	2	80.0
85	Buffalo	Swiss Dairy	225	2	12/14/17	14	In bot.	B	2	8	6	1	......	6	57.1
86	Buffalo	J. Szalankiewitz	350	5	2/ 8/18	14	In bot.	A & B	2	7	7	1	3	4	71.3
87	Buffalo	J. Tagliarino	800	9	1/ 7/18	17	Batch	A	2	11	6	1	3	3	82.2
88	Buffalo	W. A. Targe	250	2	11/15/17	14	In bot.	A & B	2	8	6	1	2	4	71.3
89	Buffalo	Louis Taylor	600	10	2/11/18	12	In bot.	B	2	10	2	1	2	4	66.6
90	Buffalo	William Toy	200	3	12/15/20	8	In bot.	B	......	......	......	......	......	8	......
91	Buffalo	Vanderbless Bros.	640	7	12/13/17	13	Cont.	A & B	2	10	3	1	1	2	84.6
92	Buffalo	Edward Vollman	320	2	12/23/20	15	In bot.	B	......	......	......	......	......	15	......
93	Buffalo	Hermann Van Dyke	350	3	9/ 5/18	16	In bot.	A & B	2	9	7	1	2	9	43.7
94	Buffalo	Stanley Wargula	300	3	11/18/19	11	In bot.	B	......	......	......	1	3	8	27.2
95	Buffalo	A. Wilke	960	10	5/22/19	10	Batch	B	......	......	......	1	1	9	10.0
96	Buffalo	William Weckerle	3,200	30	11/14/17	13	Cont.	B	2	10	3	1	2	1	92.3
97	Buffalo	Wilbert Milk Co.	1,100	11	2/13/18	12	In bot.	A & B	2	7	5	1	2	3	75.0
98	Buffalo	J. Yahrstorfer	375	4	1/11/18	15	Cont.	A & B	2	7	8	1	1	7	53.3
99	Canandaigua	Big Elm Dairy	800	7	4/27/20	9	Cont.	B	......	......	......	......	......	7	......
100	Collins	Pure Gold Ice Cream Co.	400	9	4/29/20	13	Batch	A	......	......	......	......	......	13	......
101	Corning	W. H. Mann	1,500	15	3/20/17	21	Batch	B	3	11	10	1	......	10	52.4
102	Colden	Queen City Dairy Co.	5,000	95	10/ 8/18	16	Cont.	B	1	4	12	1	9	3	81.3
103	East Aurora	Queen City Dairy Co.	6,500	66	1/21/18	18	Batch	B	1	7	6	1	5	1	92.3
104	Elmira	Atwater Bros.	1,300	6	3/20/17	16	Batch	A	3	8	8	1	4	4	75.0

105	Forks	Joseph Schmidtbauer	280	Own dairy	1/10/18	18	Cont.	B	2	7	11	1	5	6	66.6
106	Forks	T. W. Ferry	500	Own dairy	1/20/19	19	In bot.	B	...	...	...	1	6	13	31.6
107	Geneva	Geneva Milk Co.	1,700	27	4/23/17	20	Cont.	B	3	12	8	1	2	6	70.0
108	Geneva	White Spring Farm Dairy	2,300	18	4/20/17	12	Cont.	B	3	7	5	1	1	6	50.0
109	Glens Falls	Glens Falls Dairy Co.	4,000	25	8/ 7/17	19	Batch	B	2	8	11	1	2	9	52.6
110	Glenwood	Queen City Dairy Co.	6,500	68	10/ 8/18	16	Cont.	B	1	5	11	1	4	7	56.2
111	Gouverneur	Marble City Dairy Co.	700	6	3/13/17	9	Batch	A	3	3	6	1	1	5	44.4
112	Harrison	Davis Bros.	4,000	22	6/ 6/17	18	Cont.	A & B	2	11	7	1	3	4	77.8
113	Herkimer	Sanitary Milk Producers, Inc.	2,000	12	2/ 5/19	25	Batch	B	...	...	25	1	11	14	44.0
114	Herkimer	Lovier & Putnam	800	7	2/ 5/19	29	Batch	B	...	...	29	1	6	23	13.8
115	Hornell	Harold H. Granger	1,000	21	9/ 8/19	11	Batch	B	...	...	11	1	2	9	18.2
116	Hornell	Dairy Maid Creamery	2,500	22	9/ 9/19	19	Batch	B	...	...	19	1	2	17	10.5
117	Hornell	June Dairy Co.	3,000	27	7/27/17	26	Batch	B	2	19	7	1	6	13	50.0
118	Ilion	Mohawk Valley Milk Co.	2,000	15	2/ 5/19	23	In bot.	B	...	...	23	1	14	9	60.9
119	Ithaca	Sanitary Ice Cream & Milk Co.	6,500	75	5/ 7/17	16	Batch	None	3	5	11	1	...	11	45.4
120	Java	Richardson & Beebe	6,000	60	2/11/18	15	Batch	B	2	6	9	1	...	9	66.6
121	Java Center	Richardson & Beebe	10,000	105	2/ 9/18	13	Batch	None	2	2	11	1	1	10	23.1
122	Kingston	Kingston Milk Producers Creamery	2,500	20	12/20/18	11	Batch	A	...	...	11	1	2	9	18.2
123	Lawton	Queen City Dairy Co., Inc.	18,000	280	2/ 9/18	11	Cont.	A & B	2	6	5	1	1	4	63.6
124	Leon	Hoefler Ice Cream Co.†	7,000	100	1/23/18	12	Batch	None	1	1	11	1	6	5	58.2
125	Lime Lake	Queen City Dairy Co., Inc.	5,000	145	1/22/18	5	Cont.	A & B	2	3	2	1	...	2	60.0
126	Lockport	Citizens Dairy Co.	1,200	10	1/ 3/18	16	Cont.	A	2	12	4	1	5	9	43.7
127	Lockport	Lockport Co-operative Dairy Assn.	3,200	40	5/13/20	10	Batch	A	...	...	...	...	...	10	...
128	Lockport	Oscar Wyles	600	4	5/13/20	6	In bot.	B	...	...	...	...	...	6	...
129	Marilla	Adams & Shearing	3,500	75	2/ 7/18	16	Batch	B	2	5	11	1	3	8	50.0
130	Massena	Pine Grove Dairy Co.	1,100	6	9/25/18	7	Batch	B	1	2	5	1	1	4	42.8
131	Massena	H. & H. Dairy	1,000	5	5/27/20	11	Batch	B	...	...	...	...	...	11	...
132	Newark	Newark Creamery Co.	9,500	55	8/15/17	29	Batch	B	2	16	13	1	1	14	51.7
133	Niagara Falls	W. W. Barnum	400	6	7/ 8/18	19	In bot.	B	1	3	16	1	4	12	36.8
134	Niagara Falls	Frank Buzzelli & Sons	1,100	14	3/ 5/18	14	Batch	B	1	3	11	1	3	8	42.8
135	Niagara Falls	Allie Capen	320	3	3/ 7/18	16	In bot.	B	1	5	11	1	5	6	62.5
136	Niagara Falls	Walter Collins	280	2	3/ 5/18	13	Cont.	A & B	1	7	6	1	2	8	46.1
137	Niagara Falls	C. F. Corrigan	525	6	7/19/18	21	Batch	A & B	1	6	15	1	9	6	71.4
138	Niagara Falls	Clyde A. Curry	400	6	7/19/18	23	In bot.	B	1	...	23	1	14	9	65.2
139	Niagara Falls	Michael J. Guziljeski	690	9	7/15/18	14	Batch	B	1	4	10	1	9	1	92.8
140	Niagara Falls	Charles T. Horton	250	3	7/17/18	19	In bot.	B	1	3	16	1	10	6	68.4
141	Niagara Falls	Alfred N. Human	250	2	7/18/18	17	In bot.	A & B	1	4	13	1	7	6	64.1
142	Niagara Falls	William S. Laughton	425	6	7/18/18	16	In bot.	B	1	1	15	1	7	8	50.0
143	Niagara Falls	Losch Bros.	600	5	7/16/18	21	In bot.	A & B	1	4	17	1	7	10	52.4
144	Niagara Falls	Niagara Dairy Co.	3,000	38	3/ 6/18	11	Cont.	B	1	4	7	1	4	3	72.7
145	Niagara Falls	Niagara Ave. Dairy Co.	600	8	3/ 6/18	16	Batch	B	1	1	15	1	6	9	43.7
146	Niagara Falls	W. E. Nicholas	1,150	13	3/ 6/18	20	Batch	B	1	6	14	1	1	13	35.0
147	Niagara Falls	C. R. Nicholas	400	5	3/24/20	7	Batch	B	...	...	...	...	...	7	...
148	Niagara Falls	Power City Dairy Co.	700	3	3/ 5/18	16	Batch	B	1	7	9	1	5	4	75.0
149	Niagara Falls	Frank F. Searles	350	3	7/17/18	23	In bot.	B	1	3	20	1	15	5	78.2
150	Niagara Falls	Henry G. Schul	750	7	7/17/18	23	In bot.	B	1	7	16	1	3	13	43.9

MILK PASTEURIZATION PLANTS INSPECTED IN 1920, EXCLUDING THOSE WHICH SHIP TO NEW YORK CITY -- (*Concluded*)

Plant No.	Location	Name	Milk in quarts handled daily	Number of dairies served by plant	Date of original inspection	Total number of recommendations made	Process used in pasteurization	Grade after pasteurization	Number reinspections made up to 1/1/20	Number recommendations carried out to 1/1/20	Number recommendations not carried out to 1/1/20	Number reinspections from 1/1/20 to 1/1/21	Number recommendations carried out from 1/1/20 to 1/1/21	Number recommendations not carried out to 1/1/21	Percentage improvements to 1/1/21 on basis of recommendations carried out
151	Niagara Falls	L. M. Stevens	460	6	7/13/18	26	In bot.	B	1	3	23	1	......	23	11.6
152	North Tonawanda	Twin City Dairy Co	2,800	33	8/ 8/18	13	Cont.	A & B	1	9	4	1	3	7	46.1
153	Olean	John H. Eaton	300	4	3/14/18	18	In bot.	A	2	9	9	1	4	5	72.2
154	Olean	Grandusky Bros	500	4	3/14/18	14	Batch	A	2	4	10	1	1	9	35.7
155	Oneonta	Oneonta Dairy Co	5,500	54	4/ 9/17	13	Cont.	B	3	2	11	1	5	6	53.8
156	Oneida	Lloyd Bros	2,000	35	8/15/17	21	Batch	B	3	11	10	1	2	12	42.8
157	Peekskill	Van Cortland Dairy Co	950	10	2/20/20	15	Batch	A & B	......	......	......	......	......	15	......
158	Pleasant Valley	Matilda Brenner	1,400	12	4/17/19	13	In bot.	A & B	......	......	13	1	8	5	61.5
159	Plattsburg	Plattsburg Dairy Co.	1,800	22	9/24/18	12	Batch	A	3	8	4	1	2	6	50.0
160	Poughkeepsie	Farmers' Cooperative Milk Co.	7,500	70	3/27/17	10	Cont.	A & B	2	3	7	1	1	6	40.0
161	Remsen	K. B. Brown & Son †	10,000	55	6/29/20	14	Cont.	B	......	......	......	......	......	14	......
162	Rochester	C. P. Bernard	300	2	1/11/18	17	Batch	B	1	......	17	......	......	17	......
163	Rochester	Big Elm Dairy Co	9,000	45	1/ 8/18	10	Cont.	B	1	3	7	......	......	7	30.0
164	Rochester	C. J. Bowker	1,300	13	8/14/18	17	Cont.	B	1	......	17	......	......	17	......
165	Rochester	Brighton Place Dairy Co.	7,000	105	8/13/18	13	Cont.	B	1	1	12	......	......	12	7.7
166	Rochester	S. T. Cambell	700	3	3/ 8/18	19	Cont.	B	1	5	14	......	......	14	26.3
167	Rochester	Consolidated Milk Co.	5,000	50	12/13/18	13	Cont.	B	1	4	9	......	......	9	38.5
168	Rochester	R. H. Darling	1,100	7	8/15/18	17	Cont.	B	1	4	13	......	......	13	23.5
169	Rochester	Peter M. Decker	1,200	4	3/ 8/18	11	In bot.	B	1	......	11	......	......	11	......
170	Rochester	W. W. Dixon	700	2	8/14/18	21	Cont.	B	1	......	21	......	......	21	......
171	Rochester	Heal & Brown	700	3	3/ 9/18	17	Batch	B	1	6	11	......	......	11	35.3
172	Rochester	A. W. Hirschman	600	4	8/16/18	15	Batch	B	1	4	11	......	......	11	26.7
173	Rochester	A. W. Korts	800	5	8/16/18	20	Cont.	B	1	4	16	......	......	16	20.0
174	Rochester	M. T. May	500	4	8/14/18	14	Batch	B	1	......	14	......	......	14	......
175	Rochester	Merts Milk Co.	2,000	14	3/ 9/18	17	Batch	B	1	4	13	......	......	13	23.5
176	Rochester	Ritter Bros	700	6	8/15/18	14	Batch	B	1	2	12	......	......	12	14.3
177	Rochester	F. R. Ziegler	650	5	12/11/18	18	Cont	B	1	1	17	......	......	17	5.5

178	Rome	B. B. Goodsell	1,150	10	8/ 4/20	10	Batch	B	......	......	......	......	......	10	......
179	Saratoga Springs	East Side Creamery	1,500	27	11/13/18	13	Batch	B	1	3	10	1	3	7	46.1
180	Schenectady	Amsterdam Dairy Co.	5,000	13	8/27/18	8	Batch	B	2	4	4	1	......	4	50.0
181	Schenectady	H. Batebolts	500	7	6/27/17	22	Batch	B	2	11	11	1	3	8	54.5
182	Schenectady	Conelly Bros.	2,000	20	8/28/18	17	Batch	B	2	6	11	1	3	8	52.9
183	Schenectady	F. Frank	1,600	35	6/27/17	19	Batch	B	2	5	14	1	4	10	47.3
184	Schenectady	International Milk Products Co.	16,000	200	9/ 6/18	12	Batch	A & B	2	7	5	1	3	2	83.3
185	Schenectady	Robert H. Myers	520	3	8/27/18	15	In bot.	B	2	11	4	1	......	4	73.3
186	Schenectady	K. C. Savanowski	1,000	10	8/28/18	15	In bot.	B	1	......	15	Temp. discontinued.			
187	Scotia	The East Side Dairy Co., Inc.	500	7	1/21/20	12	Batch	B	......	......	......	......	......	12	......
188	Sidney	H. J. Spenser & Co.	680	3	5/ 8/17	17	Batch	A & B	3	4	13	1	1	12	29.4
189	Syracuse	Cloverland Dairy Co.	7,000	45	10/3/18	17	In bot.	A	3	14	3	1	1	2	87.6
190	Syracuse	Netherland's Dairy Co.	10,000	120	10/3/18	19	Batch	A	3	10	9	1	4	5	73.6
191	Syracuse	W. E. Rose	300	2	5/ 4/17	16	Batch	None	3	10	6	1	2	8	50.0
192	Tonawanda	Matties Bros.	500	8	3/26/20	12	In bot.	B	......	......	......	......	......	12	......
193	Tupper Lake	R. C. Whitman	1,000	12	9/19/17	17	Batch	B	2	6	12	......	......	12	29.4
194	Utica	Sauquoit Valley Dairy	2,000	16	3/11/19	12	Cont.	B	1	7	5	1	2	3	81.2
195	Wales Center	Richardson & Beebe	9,800	200	1/22/18	8	Cont.	None	......	......	......	......	......	8	......
196	Waverly	S. H. Weeks	2,300	27	5/ 7/17	14	Batch	B	2	......	14	Not selling pasteurized. milk in New York State			
197	Yonkers	White Eagle Dairy	850	3	9/30/19	11	Cont.	B	......	......	11	1	6	5	54.5

Abbreviations, column 7:
Cont.= Pasteurizing by the continuous process.
Batch.= Pasteurizing by the batch process.
In bot.= Pasteurizing by the "in bottle" process.
In can = Pasteurizing by the "in can" process.

MOSQUITO EXTERMINATION (Nassau County)

In accordance with the provisions of chapter 408 of the Laws of 1916, the Nassau County Mosquito Extermination Commission submitted to the State Commissioner of Health for approval under date of May 10, 1920, the annual report of the work of the Commission for the calendar year 1919. The tentative budget of the Commission for the year 1921 was submitted to the State Commissioner of Health for approval on August 20, 1920. A list of the property, both salt marsh and upland, with a description thereof, upon which the Nassau County Mosquito Extermination Commission proposes to enter during the year 1921 for the purpose of mosquito extermination, was attached to the budget. The report and the budget referred to are printed below.

The report of the Engineering Division covering the examination of the report, estimates, methods, and plans for 1921 is also printed below. These estimates, plans, and methods were approved by the State Commissioner of Health on September 27, 1920, and forwarded to the Nassau County Mosquito Extermination Commission on September 27, 1920.

DR. HERMANN M. BIGGS, *State Commissioner of Health:*
THE BOARD OF SUPERVISORS, NASSAU COUNTY, NEW YORK.

DEAR SIRS: In compliance with section 415 of chapter 408 of the Laws of 1916, State of New York, we are submitting the following report of our work, covering the calendar year 1919.

The Nassau County Mosquito Extermination Commission is composed as follows: Hiram R. Smith, Freeport, L. I., President; Abraham Adelberg, Cedarhurst, L. I., Treasurer; John T. Pratt, Glen Cove, L. I.; Dr. Arthur D. Jaques, Lynbrook, L. I.; Daniel Morrison, Freeport, L. I.; Anton G. Hodenpyl, Locust Valley, L. I. The work is under the supervision of W. H. DeMott.

Our work is carried on under the general headings, Salt Marsh, North Shore Upland, South Shore Upland, and Winter Operations. Therefore, our report will follow those capitulations.

Salt Marsh

Contrary to the plan generally followed, we had no big spring clean up on the salt marsh in 1919. Previously, it had been the custom to employ a large crew for a few weeks in the early spring to clean all the meadow areas. In 1919, however, we decided to divide our ditched salt marsh into four sections for maintenance purposes. Each section was put in charge of an inspector who acted as a labor foreman, and a constant maintenance and patrol was kept up throughout the season, beginning April 17th. In this work 17 men were employed; 4,198,567 feet of ditches were covered five times during the season, at a cost of $6,849; and 36,620 feet of spurs were installed at a cost of $.0285 per foot.

The 1919 salt marsh ditching contract was let to Eaton, Brown & Simpson, Inc. On April 8th work was begun on the contract, and on May 17th the contract was completed. A total of 450,583 feet of ditches were installed, of which 153,464 feet were spurs, 8 x 20 inches, hand cut; and 297,119 feet were mains, 10 x 30 inches, machine cut. The total cost was $12,976.66, of which $12,504.23 was paid the contractor and $472.43 covered the time of our men, staking, measuring, and supervising. The entire installation of the contract, staking, cutting, and measuring, consumed only 29 days. The contract drained the mainland marsh from Merrick Point, Merrick, east to Seaman's Creek, Wantagh.

There are now 4,701,618 feet of salt marsh ditches on the south shore and 152,373 feet on the north shore, making a total of 4,853,991 feet of salt marsh ditching in the county.

South Shore Upland

It was not until 1919 that the work in this district was carried on with a working organization. The work done in 1918 consisted merely of limited oiling and inspections preparatory to the 1919 work. In 1919 this district was covered from Inwood to Freeport by a district inspector, four inspectors, and a labor crew of five men. The following is a summary of their work:

Total number of inspections	2,050
Total number of times breeding killed	488
Total number gallons oil used	7,279
Breeding found:	
Culex	70%
Aedes	27.5%
Anopheles	2.5%
Total footage new ditches installed	4,735
Total footage old ditches cleaned	29,230
Total footage old ditches recleaned	6,350
Number of ponds lowered	4
Number of swamps drained	8
Number of violations found	187

Area: Inwood to Freeport, as far north as Garden City.

North Shore Upland

The work in this district was carried on the same as in 1918, with a force including a district inspector, four inspectors, and a labor crew of five men. Following is the summary of their work:

Total number inspections	7,207
Total number times breeding killed	988
Total number gallons oil used	6,372

Breeding found:	1918	1919
Culex	57%	*61.4%
Aedes	2%	*13.3%
Anopheles	41%	25.3%

Total footage new ditches installed	7,439
Total footage old ditches cleaned	454,376
Total footage old ditches recleaned	1,650
Total footage pond edges cleaned	10,100
Total number ponds lowered	5
Total number swamps drained	11
Total number violations	378

Area: Great neck to Cold Spring, as far south as Mineola.

Mill Pond, Manhasset; Leeds Lake; Manhasset; Mill Pond, Roslyn; Large Pond, North Shore Country Club; and, Mill Pond, Oster Bay, drained every two weeks.

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*Increased percentage of Culex pipiens and Aedes caused by heavy rains during the months of July and August.

If a comparison is made of the work accomplished in the two upland districts, it should be remembered that the work has been carried on four years on the north shore and only two on the south shore.

Following is a summary of the upland work in the entire county, north and south shore districts combined:

Total number violations	565
Total number inspections	9,257
Total number gallons oil used	13,651
Total number times breeding killed	1,476
Total footage new ditches installed	12,174
Total footage old ditches cleaned	483,606
Total footage old ditches recleaned	8,000
Total footage pond edges cleaned	10,100
Total number ponds lowered	9
Total number swamps drained	10

Winter Operations

During the winter months of 1919 our office force consisted of three district inspectors and a clerk, with W. H. DeMott in charge.

In these months, various charts were prepared of the season's inspection, oiling, and maintenance operations. We also finished the first complete map of the south shore salt marshes of the entire county. This map is 16 feet long and scaled thereon the entire footage installed on the meadows, some 5,000,000 feet.

There were also on our winter force a mechanic and helper who overhauled, repaired, and repainted and put in first class condition the Commission's cars and boats.

This covers briefly the work done during 1919. The mosquito collection data and the malaria statistics given below will in a measure show the results of this work.

Comparative Mosquito Collection Statistics, 1918 and 1919

Mosquitoes collected throughout the county:	1918	1919
Salt marsh	165	246
Fresh water (except pipiens)	404	202
Culex pipiens	108	180
Totals	677	628
Salt marsh misquitoes east of Freeport	79	126
Culex pipiens from Inwood to Freeport	72	100
Total mosquitoes caught May 14 to July 22	515	286
Total mosquitoes caught July 28 to September 15	162	342

From the above statistics it may be concluded that about 50 per cent of the salt marsh mosquitoes in the county are east of the drained meadows; that approximately the same percentage of upland breeding is Culex pipiens, the house-to-house mosquito, against which we are not campaigning; and that before the unusually wet season beginning in July, 1919, the total number of mosquitoes caught in the county was only 286 as compared with 515 for a corresponding period in 1918.

Comparative Malaria Summary, Nassau County, L. I.

	Annually to 1915	1916	1917	1918	1919
Communities reporting	4	4	7	19	18
Doctors receiving reports			41	111	99
Doctors reporting			23	35	46
Reports received			133	79	289

	Annually to 1915	1916	1917	1918	1919
Cases reported, North Shore:					
New			51	5	2
Recurrent			17	1	6
Total	475	56	68	6	8
Cases reported, South Shore:					
New				0	1
Recurrent				0	2
Total				0	3
Cases reported throughout county:					
New			51	5	3
Recurrent			17	1	8
Total	475	56	68	6	11

From the preceding table it will be seen that in 1919 reports from 18 communities reveal only 11 malaria cases as compared with 475 cases reported annually from only 4 communities previous to 1916. The number of new cases reported in the last two years, 5 in 1918 and 3 in 1919, shows that our work has effected an almost absolute control of malarial conditions which a few years ago were truly alarming.

The following financial statements show in detail the expenditures made in 1919 and the costs of the various operations of work.

Statement of Receipts and Disbursements for 1919 as Per Cash Book Capitulation

RECEIPTS

Balance forwarded January 1, 1919	$435.69
Appropriation	53,051.34
Contributions	41.67
Sundries	119.61
Total receipts	$53,648.31

DISBURSEMENTS

Administration	$5,100.00
Inspectors	13,095.00
Labor	8,691.00
Salt Marsh contract	12,504.23
Motor vehicles	2,814.55
Oil	2,027.21
Equipment	3,432.56
Office expenses	977.17
Publicity	295.01
Supplies	249.89
Insurance	1,169.54
Sundries	1,489.17
1918 expenditures paid in 1919	1,425.60
Total disbursements	$53,270.93

SUMMARY

Receipts	$53,648.31
Disbursements	$53,270.93
Balance on hand January 1, 1920	377.38
	$53,648.31

Detailed Distribution of Disbursements According to Districts

DISTRICT NO. 1, SALT MARSH

General Operations:			
Inspection		$619.64	
Engineering, field		59.01	
Engineering, office		2.97	
Travel		27.90	
Miscellaneous		410.38	
			$1,119.90
Ditching contract:			
To contractor		$12,504.23	
Time analysis			
Staking	$257.10		
Measuring	72.28		
Clean up	26.00		
Supervision	88.22		
Travel	14.44		
Miscellaneous	14.39		
		472.43	
			12,976.66
Winter operations:			
Office, miscellaneous		$365.86	
Engineering, office		335.64	
Miscellaneous		153.50	
			855.00
Labor operations:			
Maintenance		$5,256.50	
Extension		1,044.25	
Travel		525.63	
Miscellaneous		23.00	
			6,849.38
Total cost District No. 1			$21,800.94

DISTRICT NO. 2, SOUTH SHORE UPLAND

General operations:			
Inspection		$835.39	
Oiling, time	$1,018.83		
Oiling, oil	1,048.70		
		2,067.53	
Engineering, field	$146.13		
Engineering, office	14.09		
		160.22	
Supervision		430.18	
Reinspection		17.89	
Miscellaneous		555.10	
			$4,066.31
Winter operations:			
Office, miscellaneous		$325.72	
Engineering, office		275.01	
Miscellaneous		179.27	
			780.00
Labor operations:			
Maintenance		$1,094.25	
New work		285.50	
Miscellaneous		67.25	
			1,447.00
Total cost, District No. 2			$6,293.31

DISTRICT NO. 3, NORTH SHORE UPLAND

General operations:			
Inspection		$1,117.36	
Oiling, time	$375.97		
Oiling, oil	978.51		
		1,354.48	
Engineering, field		20.54	
Supervision		259.00	
Travel		520.80	
Miscellaneous		416.33	
			$3,688.51
Winter operations:			
Office, miscellaneous		$400.48	
Engineering, office		190.33	
Miscellaneous		189.19	
			780.00
Labor operations:			
Maintenance		$1,607.63	
New work		144.87	
Miscellaneous		117.50	
			1,870.00
Total cost, District No. 3			$6,338.51

GENERAL DISTRICT

(Includes such accounts as cannot be accurately distributed among the other districts.)

Administration	$5,100.00
Motor vehicles	8,739.54
Equipment	76.45
Office expenses	977.17
Publicity	295.01
Supplies	249.89
Compensation insurance	485.34
Sundries	1,489.17
1918 expenditures paid in 1919	1,425.60
Total	$18,838.17

SUMMARY

District No. 1, Salt Marsh	$21,800.94
District No. 2, South Shore Upland	6,293.31
District No. 3, North Shore Upland	6,338.51
General District	18,838.17
Total 1919 expenditures	$53,270.93

HIRAM R. SMITH
President

Our 1921 tentative budget, in the sum of $74,000, has been prepared with due consideration for the highest degree of general efficiency possible with the funds available under the existing legislation.

An expenditure of $25,240 is apportioned to the salt marsh. This sum includes $14,160 for maintenance and patrol of 5,000,000 feet of ditching installed from the New York city line on the west to Seaman creek, Wantagh, on the east; $8,980 for a salt marsh ditching contract of approximately 294,000 feet on main island area east of Seaman creek, Wantagh, to Seaford. It is estimated that 2,000,000 feet are necessary to complete the salt marsh drainage in the county. And $2,100 for one district inspector who supervises all salt marsh work in the summer, and in the winter prepares maps and charts, and lays out the plan of work for the ensuing year.

Our upland work is divided into two districts, south shore and north shore. The sum of $10,476 is set aside for the south shore, providing $4,200 for inspection, and oiling when necessary, of all ponds, swamps, brooks, and wet areas from Inwood to Merrick; also to maintain an efficient number of men throughout the winter months to patrol; $4,176 for a labor crew consisting of a foreman and six laborers to do the maintenance work and a limited amount of permanent elimination over the same territory; and $2,100 for the salary of a district inspector whose duties are the same in relation to his district as those of the salt marsh district inspector.

The sum of $10,476 for the north shore provides a district inspector and four inspectors the same as for the south shore.

The administration item of $6,300 includes the salaries of the chief engineer, secretary, and clerk.

Operating expenses in the amount of $18,976.50 includes the running expenses of our eight cars and three boats; the wages of a mechanic; the overhead costs of garage and boathouse rent, and boat hire; mosquito oil for temporary extermination purposes; equipment as itemized; insurance, office expenses, and publicity; and supplies which include all tools used in the field, both upland and salt marsh. These estimates of quantities and expenditures are all based on the actual amounts and costs of corresponding items during the current year.

The contingent fund of $2,537.50 is to cover any unforeseen circumstances that may arise throughout the year.

Respectfully submitted

THE NASSAU COUNTY MOSQUITO
EXTERMINATION COMMISSION
HIRAM R. SMITH
President

Nassau County Extermination Commission, 1921 Tentative Budget

I. Salt Marsh

Maintenance and Patrol:		
4 inspectors (April 15–September 30), 5½ months, at $120 per month	$ 2,640.00	
20 laborers (April 15–September 30), 24 weeks, at $24 per week	11,520.00	
Contract:		
Footage cost	8,820.00	
2 helpers, 20 days, at $4 per day	160.00	
Salaries:		
1 district inspector, 12 months, at $175	2,100.00	
		$25,240.00

II. South Shore Upland

Inspection:		
4 men (April 15–September 30), 5½ months, at $120	$2,640.00	
2 men (October 1–April 15), 6½ months, at $120	1,560.00	
Labor:		
1 foreman (April 15–September 30), 24 weeks, at $30 per week	720.00	
6 laborers (April 15–September 30), 24 weeks, at $24 per week	3,456.00	
Salaries:		
1 district inspector, 12 months, at $175	2,100.00	
		10,476.00

III. North Shore Upland

Inspection:		
4 men (April 15–September 30), 5½ months, at $120	$2,640.00	
2 men (October 1–April 15), 6½ months, at $120	1,560.00	
Labor:		
1 foreman (April 15–September 30), 24 weeks, at $30 per week	720.00	
6 laborers (April 15–September 30), 24 weeks, at $24 per week	3,456.00	
Salaries:		
1 district inspector, 12 months, at $175	2,100.00	
		10,476.00

IV. Administration

Chief engineer	$3,000.00	
Secretary	1,800.00	
Clerk	1,500.00	
		6,300.00

V. Operating Expenses

Motor vehicles:		
Running expenses, autos (8)	$3,000.00	
Running expenses, boats (3)	600.00	
Labor:		
1 mechanic, 12 months, at $150	1,800.00	
Overhead costs:		
Garage and boat house, at $50 per month	600.00	
Boat hire, 5½ months, at $25 per month	137.50	
Mosquito oil, 20,000 gallons, at 23c	4,600.00	
		10,737.50
Equipment:		
1 auto exchange	$ 475.00	
4 oil sprayers	64.00	
Tools for garage	1,500.00	
2 motor boats with engines, exchange	2,000.00	
Insurance:		
Compensation	1,500.00	
Motor vehicles	700.00	
Office expenses	1,000.00	
Publicity	500.00	
Supplies	500.00	
		8,239 00

VI. Contingent Fund

Contingent fund	$2,531.50	
		2,531.50
Total		$74,000.00

A list of property owners in the general description of the property on which the work of the Commission is to be carried on during 1921 was attached to the above but is not here included.

HERMANN M. BIGGS, M.D., *State Commissioner of Health:*

I beg to submit the following report on our examination of the estimates, plans, and methods for mosquito extermination work in Nassau county for the year 1921, submitted for your approval by the Nassau County Mosquito Extermination commission under and in accordance with the provisions of section 412 of chapter 408 of the Laws of 1916.

The following papers and map were submitted on August 20, 1920, by the Commission for your approval:

1. A budget or detailed estimate of the moneys required for the year 1921, including a statement and plans of the Commission for the work during 1921 and the methods to be employed.

2. A list of the property, both salt marsh and upland, with a general description thereof, upon which the Nassau County Mosquito Extermination commission proposes to enter during the year 1921 for the purpose of mosquito extermination.

3. Map of the south shore of Nassau county showing salt marsh areas to be drained by the Commission in 1921, and the areas drained in this section of the county in previous years, together with the areas that will not have been drained by the end of 1921.

On September 22, 1920, the following map was submitted at my request in order to facilitate the examination of the estimates, plans, and methods:

A map of Nassau county showing the salt marsh areas to be drained by the commission in 1921, the areas drained in previous years and the areas which will not have been drained by the end of 1921, together with the total number and location of violations on the north shore and south shore under control in the season of 1920.

The total budget for the ensuing year of 1921 amounts to $74,000, which is the largest budget of the Commission since it was organized in 1916, and is approximately 37 per cent greater than the budget for 1920. The budget for 1921 is divided into the following general headings:

1. Salt Marsh;
2. South Shore Upland;
3. North Shore Upland;
4. Administration;
5. Operating Expenses;
6. Contingent Fund.

The largest item of the budget is $25,240, for salt marsh work, which is equal to 36 per cent of the entire budget. Of this amount, $14,160 is for maintenance and patrol of some 5,000,000 feet of ditching installed from the New York city line on the west to Seaman creek, Wantagh, on the east: $8,980 for ditching contract for some 294,000 feet of new salt marsh ditching on mainland and islands east of Seaman creek, Wantagh, to Seaford, covering an area of 1,500 acres; and $2,100 for the salary of one district inspector. When the proposed new ditching is completed, all of the salt marsh area on the southerly shore of Nassau county except a comparatively small area equal to some 2,500 acres in the town of Oyster Bay east of Seaford, bordering on South Oyster bay near the Suffolk county line, will have been covered.

The cost of south shore upland extermination work and the north shore upland extermination work is estimated at $10,476 for each of these two districts. This estimate is an increase of nearly 60 per cent over the estimate for these districts for 1920, and represents partly increases in the force and partly increases in the cost of labor and inspection. In detail, this item includes $4,200 for inspection; $4,176 for labor; and $2,100 for the salary of a district inspector for each district. The work to be done in these two districts consists of oiling ponds, swamps, brooks, and wet areas; maintaining patrol during winter months; maintenance work; and some permanent elimination.

The administration expenses are estimated at $6,300, and include the salaries of the chief engineer, secretary, and clerk. This item is $600 larger than last year, and represents an increase of $600 per year in the salary of the chief engineer.

The item for operating expenses amounts to $18,976.50, an increase of approximately 60 per cent over this item in the 1920 budget. It includes running expenses of automobiles and motor boats; salary of a mechanic; boat hire; garage and boathouse rent; purchase of 20,000 gallons of oil;

equipment, such as auto exchange, oil sprayers, tools, and motor boats; insurance; office expenses; publicity; and office supplies. The last item of the budget amounts to $2,537.50, and covers contingent expenses for the year.

A comparison of the budget for the ensuing year with the budgets for previous years shows that there has been a gradual decrease in the percentage of the funds expended for salt marsh ditching, and an increase in the percentage of cost for inspection and maintenance of both upland areas and salt marsh ditching. Only 12 per cent of the budget for 1921 is for new salt marsh ditching, whereas the percentage of previous budgets allotted for such work was 13.3 per cent for 1920, 23 per cent for 1919, 35 per cent for 1918, and 39 per cent for 1917. The total estimated cost for new ditching for 1921 is, however, $1,805 greater than that estimated for the year 1920. It is to be expected that the proportion of funds for maintenance will gradually increase in proportion to the amount of new ditching completed and that the relative cost of new work will decrease. There has also been a marked increase in the cost of labor and materials over previous years.

The force to be employed by the Commission for the year 1921 is to consist of a chief engineer, secretary, clerk, 3 district inspectors, and a mechanic to be employed throughout the entire year; 12 inspectors, 2 foremen, and 32 laborers to be employed from April 15th to September 30th; and 4 inspectors to be employed from October 1st to April 15th, making the total number of employees of the Commission 53, assuming that the 4 men listed for winter patrol work will also be employed as inspectors during the summer months. The increase in the force over last year should enable the Commission to carry on the work for the ensuing year even more effectively than in the past.

In conclusion I would state that it apears from the careful examination of the estimates, plans, and methods submitted that the apportionment of the various funds and items of the budget for 1921 is appropriate, considering the present high cost of labor and materials and the present status of the extermination work. Whereas it is impracticable to check up except in a general way the cost estimated for doing the work, the estimates submitted appear to be reasonable and approximately accurate and the work properly planned so far as it is possible to judge without a detailed inspection of the areas in which the work is to be carried on.

I would therefore recommend that the estimates, plans, and methods as submitted covering the year 1921 be approved in accordance with the provision of section 412 of chapter 408 of the Laws of 1916, and that they be forwarded to the Board of Supervisors of Nassau county.

Respectfully submitted

THEODORE HORTON

Chief Engineer.

ALBANY, N. Y., *September* 25, 1920

OTHER SPECIAL INVESTIGATIONS

During 1920 a number of special lines of work were carried on, including inspections of sanitary conditions of county fair grounds; investigation of the sanitary conditions of the camps in the Palisades Interstate Park, and the investigation of the nuisance created in New York city by the operation of certain industrial plants at Edgewater, N. J.

An investigation was made at the direction of the Public Health Council of the sanitary condition of county fair grounds in this State. The services of a sanitary inspector were devoted from July 1 to September 30 to the investigation. The work was confined particularly to water supply, toilet facilities, and methods of sewage disposal and garbage disposal. Of the 82 fair grounds at which fairs were held during 1920 all were inspected with one exception. While fairs were being held at the grounds at Altamont, Hamburg, Nassau, and Oneonta, three engineers and one inspector of the Division visited each of these fairs and collected data on attendance and the use of toilets. A detailed report upon this investigation was being prepared at the end of the year.

An investigation was also made at the request of the Public Health Council of the sanitary condition of the Palisades Interstate Park camps during the past summer. The park consists of some 36,000 acres, and lies between the Palisades and the Ramapo Mountains, extending into New Jersey, and is controlled by a joint commission. It is supported by private subscription as well as by funds from the States of New York and New Jersey. The survey was begun by one of the assistant engineers of the Engineering Division on August 10, 1920, and was completed on September 4, 1920. The survey included a study of the water and sewerage facilities and the general sanitary condition of the various camps. The report on the investigation was being prepared at the end of the year.

The investigation of the nuisance created in the Riverside Drive section of New York city by the operation of industrial plants at Edgewater, N. J., was continued during this year. The scrubbers and condensers installed last year at the plant of the Corn Products Refining Company for the purpose of elimi-

nating the objectionable odors and gases discharged from the plant of this company were not efficacious, and at the end of this year a system of scrubbers, blowers, and conduits for conveying the odors and gases from the feed dryer stacks to the boiler plant of the power house for combustion was being installed. A scrubber designed to eliminate the gases and vapors generated in the process of "boiling" or "ageing" linseed oil at the plant of Spencer–Kellogg & Sons was installed during the year. With the completion of these installations all of the industrial plants will have constructed scrubbers or so modified the operation of the plants as largely to abate the objectionable conditions created by the discharge of gases and odors.

During the year the Engineering Division has assisted the State Architect and State Engineer in the work of obtaining new or additional water supplies for the Gowanda State Hospital and the Matteawan State Hospital, and in the design of a new sewage disposal plant for the Central Islip State Hospital. A number of conferences have also been held with representatives of these two departments and advice given in connection with the preparation of plans for water supply and sewage disposal for other state institutions.

A number of lectures on sanitary engineering subjects have been given during the year by members of the Engineering Division before public bodies and mass meetings in municipalities, and in connection with educational courses on public health and sanitation.

INDEX TO LEGISLATIVE DOCUMENTS, 1921

A

	Doc. No.
Agricultural Experiment Station, report	45
Agriculture, State College of, Cornell University, report	45
Albion, Western House of Refuge for Women, report	72
Appropriations, report of Budget Committee on requests for	11
Architect, State, annual report	39
Assembly, bills, supplemental index	92
committees, list	27
members, list	2
Attorney-General, report	53

B

Banks, Superintendent of, report on banks of deposit and discount	4
on Savings and loan associations, Land banks, etc	5
on Savings banks, Trust companies, etc	6
Barge canal, message from Governor regarding resolution by Congress on.	24
Batavia, New York State School for the Blind, report	21
Bath, New York State Soldiers' and Sailors' Home, report	34
Bedford Hills, New York State Reformatory for Women, report	70
Bills, Assembly, supplemental index	92
Senate, supplemental index	91
Blind, report of International Sunshine Society on	86
State Commission for, report	84
State School for, report	21
Boards, commissions and departments, *see specific names for.*	
Boundary waters, preliminary report of Commission on	20
Boxing Commission, report	79
Bridge and Tunnel Commission, report	64
Budget committee, report on requests for appropriations	11
Buffalo, Charity Organization Society, report	35

C

Canals, report of Comptroller relating to expenditures on	59
Barge canal, message from Governor on	24
St. Lawrence Ship Canal, preliminary report of Commission on	20
Charities, Fiscal Supervisor, report	87
Charities, State Board of, report	49
Charity Organization Society of the City of Buffalo, report	35
Child welfare, report of Commission to examine laws relating to	76
Children's Village, report	81
Civil Service Commission, report	90
Commissions and departments, *see specific names for.*	
Committees of the Assembly, list	27
Committees of the Senate, list	22, 29
revised list	28
Commutations granted by Governor, statement of	54
Comptroller, State, report	10
report on expenditures on the canals	59
special report on municipal accounts	9
Conrad Poppenhusen Association, annual report	78
Conservation Commission, report	95
Cornell University, State College of Agriculture, report	45
State Veterinary College, report	8
Credit unions, report of Superintendent of Banks relative to	5
Crippled and deformed children, New York State Hospital for, report	83